



**UNSW**  
AUSTRALIA

# Course outline

Semester 1 2017

Never Stand Still

Engineering

Mechanical and Manufacturing Engineering

## **AVEN1920**

# **INTRODUCTION TO AIRCRAFT ENGINEERING**

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## 1. Staff contact details

Position	Name	Email	Availability and location	Phone ext.
Course Convener	John Page	<a href="mailto:j.page@unsw.edu.au">j.page@unsw.edu.au</a>	As requested, J17/311J	54090
Lecturer/tutor	John Olsen	<a href="mailto:j.olsen@unsw.edu.au">j.olsen@unsw.edu.au</a>	As requested, J17/311C	55217
Lecturer/tutor	Sangarapilla Kanapathipillai	<a href="mailto:j.page@unsw.edu.au">j.page@unsw.edu.au</a>	As requested, J17/ 408J	54090
Demonstrator Mechanics	Xiaogang Zhang	<a href="mailto:xzhang@unsw.edu.au">xzhang@unsw.edu.au</a>	Via email	
Demonstrator Mechanics	Alireza Moridi	<a href="mailto:alireza.moridi@gmail.com">alireza.moridi@gmail.com</a>	Via email	
Demonstrator Mechanics	Muhammad Haneef	<a href="mailto:m.haneef@unsw.edu.au">m.haneef@unsw.edu.au</a>	Via email	
Demonstrator Aero.Eng.	Momar Hughes	<a href="mailto:momar.hughes@student.unsw.edu.au">momar.hughes@student.unsw.edu.au</a>	Via email, J17/311	
Demonstrator Aero.Eng.	William Crowe	<a href="mailto:w.crowe@unsw.edu.au">w.crowe@unsw.edu.au</a>	Via email, J17/311	

## 2. Course details

### Credit Points

This is a 6 unit-of-credit (UoC) course, and involves 4 hours per week (h/w) of face-to-face contact.

The UNSW website states “The normal workload expectations of a student are approximately 25 hours per semester for each UoC, including class contact hours, other learning activities, preparation and time spent on all assessable work. Thus, for a full-time enrolled student, the normal workload, averaged across the 16 weeks of teaching, study and examination periods, is about 37.5 hours per week.”

This means that you should aim to spend about 9 h/w on this course. The additional time should be spent in making sure that you understand the lecture material, completing the set assignments, further reading, and revising for any examinations.

### Contact hours

	Day	Time	Location
Lectures	Monday	10.00am – 12.00am	Ainsworth 102
	Tuesday	2pm - 4pm	Ainsworth 102

### Summary of the course

This course is aimed at first year students in aviation and other students who feel they could benefit from some understanding of aerospace engineering. It is not intended for students planning to have a career in aerospace engineering. However, it does provide a general understanding of aircraft engineering for pilots, aviation administrators and others for whom the knowledge would be beneficial.

### Aims of the course

The course aims to give students an overview of the practice and theory behind aircraft engineering. It will encourage students to carry out simple engineering analysis to explore the claims of the manufacturers. In addition, it will introduce students to some of the sources of data available on aircraft and the need to take care. It will further provide students an opportunity to produce a report according to professional standards and encourage industry quality behaviour.

### Student learning outcomes

After completion of the course, students should feel confident in exploring material related to aeronautical engineering. They should also have learnt how to carry out simple engineering calculations. The final reports should enhance their ability to produce a document to an acceptable professional standard.

Engineers Australia Stage 1 Competencies for Professional Engineers do not apply to this course as it is not an engineering course.

### 3. Teaching strategies

There are two distinct methods of teaching on this course. The first involves the classic lecture approach where the students are introduced to concepts and approaches, and the understanding is assessed using quizzes and internal exams. The other approach uses a combined studio approach: The students are provided with some techniques for calculating aircraft properties, which they then apply to an aircraft they have selected from a provided list.

### 4. Course schedule

Week	Date	Topic	Lecture Content
1	27/2	Mechanics	Forces
	28/2	Aero Eng	Course introduction Major aircraft components
2	6/3	Mechanics	Forces Early flight
	7/3	Aero Eng	Aerofoil nomenclature Lift
3	13/3	Mechanics	Moments
	14/3	Aero Eng	Straight and level flight drag, thrust and power
4	20/3	Mechanics	Equilibrium
	21/3	Aero Eng	Accelerated flight. Loading and trim
5	26/3	Mechanics	Equilibrium
	27/3	Aero Eng	Take-off and Landing and undercarriages
6	3/4	Mechanics	Rigid Body Motion
	4/4	Aero Eng	Flight controls, and instruments autopilots
7	10/4	Mechanics	<b>Quiz: Mechanics</b>
	11/4	Aero Eng	Piston engines and turboprop engines Turbo Fans and Jets
<b>Mid-semester break</b>			
8	24/4	Aeronautics	Introduction to Commercial aircraft
	25/4		<b>Anzac Day</b>
9	1/5	Aeronautics	Rotary Aircraft
	2/5	Aero Eng	Navigation systems and flight director systems
10	8/5	Aeronautics	Green aircraft
	9/5	Aero Eng	Aircraft materials and Structures

Week	Date	Topic	Lecture Content
11	15/5	Aeronautics	Future Designs
	16/5	Aero Eng	Energy height methods
12	22/5	Aeronautics	Drones
	23/5	Aero Eng	Environmental Control
13	5/6	Aeronautics	<b>Exam</b>
	6/6	Aero Eng	<b>Submit report</b>

## 5. Assessment

Assessment	Length	Weight	Due date and submission requirements	Deadline for absolute fail
Quiz	One hour	25%	26/4	N/A
Project one	Approximately Five Pages	10%	4/4	10/4
Project Two	Approximately Fifteen pages	45%	6/6	9/6
Exam	One Hour	20%	5/6	N/A

The exam and quiz will be marked in the normal way. Students will be expected to obtain at least 50% for both the quiz and the exam.

Projects will be carried out on the basis of advice given by the tutors and demonstrators, and they will be marked on the basis of how well that advice was adhered to.

### Assignments

#### *Presentation*

All non-electric submissions should have a standard School cover sheet which is available from this course's Moodle page.

All submissions are expected to be neat and clearly set out. Your results are the pinnacle of all your hard work and should be treated with due respect. Presenting results clearly gives the marker the best chance of understanding your method; even if the numerical results are incorrect.

#### *Submission*

Late submissions will be penalised 5 marks per calendar day (including weekends). An extension may only be granted in exceptional circumstances. Where an assessment task is worth less than 20% of the total course mark and you have a compelling reason for being unable to submit your work on time, you must seek approval for an extension from the course convenor **before the due date**. Special consideration for assessment tasks of 20% or greater must be processed through [student.unsw.edu.au/special-consideration](http://student.unsw.edu.au/special-consideration).

It is always worth submitting late assessment tasks when possible. Completion of the work, even late, may be taken into account in cases of special consideration.

Where there is no special consideration granted, the 'deadline for absolute fail' in the table above indicates the time after which a submitted assignment will not be marked, and will achieve a score of zero for the purpose of determining overall grade in the course.

### *Marking*

Marking guidelines for assignment submissions will be provided at the same time as assignment details to assist with meeting assessable requirements. Submissions will be marked according to the marking guidelines provided.

### **Examinations**

You must be available for all tests and examinations. Final examinations for each course are held during the University examination periods, which are June for Semester 1 and November for Semester 2.

Provisional Examination timetables are generally published on myUNSW in May for Semester 1 and September for Semester 2

For further information on exams, please see the [Exams](#) section on the intranet.

### *Calculators*

You will need to provide your own calculator, of a make and model approved by UNSW, for the examinations. The list of approved calculators is shown at [student.unsw.edu.au/exam-approved-calculators-and-computers](http://student.unsw.edu.au/exam-approved-calculators-and-computers)

It is your responsibility to ensure that your calculator is of an approved make and model, and to obtain an "Approved" sticker for it from the School Office or the Engineering Student Centre prior to the examination. Calculators not bearing an "Approved" sticker will not be allowed into the examination room.

### **Special consideration and supplementary assessment**

For details of applying for special consideration and conditions for the award of supplementary assessment, see the School [intranet](#), and the information on UNSW's [Special Consideration page](#).

## **6. Expected resources for students**

As this course has a high element of research in it, you will be expected to use multiple sources, but the lecturers and demonstrators are more than willing to point you in the right direction.

You will need to make a lot of use of the library. The website is:  
<https://www.library.unsw.edu.au/>

## 7. Course evaluation and development

Feedback on the course is gathered periodically using various means, including the UNSW myExperience process, informal discussion in the final class for the course, and the School's Student/Staff meetings. Your feedback is taken seriously, and continual improvements are made to the course based, in part, on such feedback.

## 8. Academic honesty and plagiarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW students have a responsibility to adhere to this principle of academic integrity. Plagiarism undermines academic integrity and is not tolerated at UNSW. *Plagiarism at UNSW is defined as using the words or ideas of others and passing them off as your own.*

Plagiarism is a type of intellectual theft. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement. UNSW has produced a website with a wealth of resources to support students to understand and avoid plagiarism: [student.unsw.edu.au/plagiarism](http://student.unsw.edu.au/plagiarism) The Learning Centre assists students with understanding academic integrity and how not to plagiarise. They also hold workshops and can help students one-on-one.

You are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting and the proper referencing of sources in preparing all assessment tasks.

If plagiarism is found in your work when you are in first year, your lecturer will offer you assistance to improve your academic skills. They may ask you to look at some online resources, attend the Learning Centre, or sometimes resubmit your work with the problem fixed. However more serious instances in first year, such as stealing another student's work or paying someone to do your work, may be investigated under the Student Misconduct Procedures.

Repeated plagiarism (even in first year), plagiarism after first year, or serious instances, may also be investigated under the Student Misconduct Procedures. The penalties under the procedures can include a reduction in marks, failing a course or for the most serious matters (like plagiarism in an honours thesis) even suspension from the university. The Student Misconduct Procedures are available here:  
[www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf](http://www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf)

Further information on School policy and procedures in the event of plagiarism is available on the [intranet](#).

## 9. Administrative matters

All students are expected to read and be familiar with School guidelines and policies, available on the intranet. In particular, students should be familiar with the following:

- [Attendance, Participation and Class Etiquette](#)
- [UNSW Email Address](#)
- [Computing Facilities](#)
- [Assessment Matters](#) (including guidelines for assignments, exams and special consideration)
- [Academic Honesty and Plagiarism](#)
- [Student Equity and Disabilities Unit](#)
- [Health and Safety](#)
- [Student Support Services](#)

*John Page*  
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