



UNSW

# Course Outline

Semester 1 2015

## **AERO3660 FLIGHT PERFORMANCE AND PROPULSION**

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## 2. COURSE DETAILS

### Class contact

The class contact will include the following sessions:

#### **Lecture periods**

Wednesday 9.00am to 11:00am (Electrical Eng 224)

Thursday 1:00pm to 2:00pm (Webster Theatre B (F Hall B))

#### **Dr John Olsen is only available for consultation on:**

Thursday 2:00pm to 3:00pm (REDC 1040)

### Tutorial work

It is essential that you make full use of the consultation periods and attempt relevant problems as soon as possible after a topic has been covered in lectures periods. The problems I suggest you look at are essential to consolidate understanding of the subject and to reveal aspects of the course which you have not understood. You should use a notebook for your worked solutions.











## Assignments

See above

## Laboratory work

The flight exercises at Bankstown might be considered as a lab. You will be briefed in semester 2 on what to do, take and how to behave at Bankstown.

Also the simulation exercise might be considered as a lab too. The simulation exercise will be carried out by each student individually on the flight simulator in room Building F21 Room 107F. The exercise is booked by writing your name and surname on the list provided outside room L204 next to the time slot you chose. Please note that a successful completion of the flight simulation is a **pre-requisite** for the flight experiments.

As far as flight simulation is concerned students will be allowed to book their own times for the exercise. Once you book a simulation session it becomes compulsory. You are allowed to cancel the booking, otherwise you will **lose marks** for not turning up or for being late.

The flight exercises will require an extremely high level of punctuality and discipline. A special briefing session will be held on the first day of the exercise where you are going to be introduced with the rules governing in-flight and air-side behaviour. The most important part is to always obey instructions given by the flight personnel and your lecturers.

## Presentation

A standard specification is available from the school website to aid presentation of your assignments (in all courses). <https://www.engineering.unsw.edu.au/mechanical-engineering/forms-and-guidelines>

All submissions should have a standard school cover sheet. All submissions are expected to be neat, and clearly set out. All calculations should be shown as, in the

## **Examination**

There will be one three-hour examination at the end of the session, covering all material for the whole session.

You will need to provide your own calculator, of a make and model approved by UNSW, for the examination. The list of approved calculators is shown at:  
<https://student.unsw.edu.au/exam-approved-calculators-and-computers>

## **6. ACADEMIC HONESTY AND PLAGIARISM**

Plagiarism is using the words or ideas of others and presenting them 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 booklet which provides essential information for avoiding plagiarism: <https://my.unsw.edu.au/student/academiclife/Plagiarism.pdf>

There is a range of resources to support students to avoid 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. Information is available on the dedicated website Plagiarism and Academic Integrity website: <http://www.lc.unsw.edu.au/plagiarism/index.html>

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

under the Student Misconduct Procedures.

## 7. COURSE SCHEDULE

- ✚ The atmosphere, airspeeds, introduction to lift and drag.
- ✚ Straight and level flight. Steady climb and descent.
- ✚ Reciprocating piston engines, actuator disk theory, blade element theory.
- ✚ Compressible flows.
- ✚ Introduction to gas turbines, net thrust, propulsive & component efficiency.
- ✚ Exergy analysis of open systems.
- ✚ Range and endurance equations.
- ✚ Polytropic efficiency and gas turbine analysis.
- ✚ Turning flight. Gliding flight.
- ✚ Energy methods. Take off and landing analysis.
- ✚ Gas mixtures and chemical reactions.
- ✚ Military gas turbines and rockets.

The course will not be taught in the order presented above. Due to difficulties in establishing the new degrees, some students have not passed either flight performance or propulsion. This year, we will have to cater for these students as best we can.

A separate document has been produced to explain in more detail what is happening this year. Please note that the course schedule as outlined above could change at short notice.

**8.**

J. A. Camberos & D. J. Moorhouse, 2011,