AVEN2230

AVIATION TECHNOLOGIES

AVEN2230: AVIATION TECHNIQUES
COURSE OUTLINE

1. STAFF CONTACT DETAILS

Contact details for course convener

A/Prof N. A. Ahmed
(also responsible for Aerodynamics Component)
Room G17/464K
Tel (02) 9385 4080
Fax (02) 9663 1222
Email n.ahmed@unsw.edu.au

Contact details for additional lecturers and demonstration/laboratory teaching staff

Dr J. Olsen (Propulsion Component)
Room F21/107J
Tel (02) 9385 5217
Fax (02) 9663 1222
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Dr N. Tsafnat (Flight Dynamics/Simulation Component)
Room G17/464D
Tel (02) 9385 6158
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Dr Z. Vulovic (Systems Component and Simulation demonstrations)
Room F21/107D
Tel (02) 9385 6261
Fax (02) 9663 1222
Email z.vulovic@unsw.edu.au

Casual Staff:
Yong Ying Zheng, Yendrew Yauwenas , Tzi Chieh (Monica) Chi ,William Crowe

Laboratory Officer:
Terry J. Flynn, Bruce Oliver

Consultation Please check with each Lecturer/demonstrator of this course for consultation

2. COURSE DETAILS

Units of credit

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

approximately 25 hours per semester for each UoC, including class contact hours, other learning activities, preparation and time spent on all as

For a standard 24 UoC in the semester, this means 600 hours, spread over an effective 15 weeks of the semester (thirteen weeks plus stuvac plus one effective exam week), or 40 hours per week, for an average student aiming for a credit grade Various factors, such as your own ability, your target grade, etc., will influence the time needed in your case. Some students spend much more than 40 h/w, but you should aim for not less than 40 h/w on coursework for 24 UoC.

This means that you should aim to spend not less than about 10 h/w on this course, i.e. an additional 4 h/w of your own time. This should be spent in making sure that you understand the lecture material, completing the set assignments, further reading about the course material, and revising and learning for the examination.

There is no parallel teaching in this course.

Summary of the course

This course will cover aspects of aviation systems and avionics, aerodynamics, aircraft control and performance.

Aims of the course

The aim

Be familiar with the basic principles associated with incompressible flow in wing design
Demonstration of the significance of some of the concepts used in wing design through physical experimentation
Become familiar with numerical experimentation using computational fluid dynamics
Decide on the appropriate class of wing in the design of a new aircraft.
Understand the effect of pressure loss in hydraulic, pneumatic, and fuel system.

Graduate attributes

https://my.unsw.edu.au/student/atoz/GraduateAttributes.html

UNSW graduates will be:

Scholars who are:

1. understanding of their discipline in its interdisciplinary context (*)
2. capable of independent and collaborative enquiry (*)
3. rigorous in their analysis, critique, and reflection (*)
4. able to apply their knowledge and skills to solving problems (*)
5. ethical practitioners (*)
6. capable of effective communication (*)
7. information literate (*)
8. digitally literate

Leaders who are:

9. enterprising, innovative and creative (*)
10. capable of initiating as well as embracing change (*)
11. collaborative team workers (*)

Professionals who are:

12. capable of independent, self-directed practice (*)
13. capable of lifelong learning (*)
14. capable of operating within an agreed Code of Practice (*)

Global Citizens who are:

15. capable of applying their discipline in local, national and international contexts (*)
16. culturally aware and capable of respecting diversity and acting in socially just/responsible ways
17. capable of environmental responsibility

Graduate attributes targeted and developed in this course are marked with an asterisk (*). Furthermore, these professional attributes are also identified in the Assessment.

It is expected that assignments will be marked and handed back within two weeks following submission. You will have feedback and discussion while fresh in your mind to improve the learning experience.

4. TEACHING STRATEGIES

Lectures in the course are designed to cover the terminology and core concepts and theories in the design, selection of airfoil sections wing configurations in aircraft design. They do not simply reiterate the texts, but build on the lecture topics using physical experimentation that are generally used in research and aerospace industries.

Demonstrations are designed to provide you with feedback and discussion on the various topics covered both in lectures and laboratory works, and to investigate problem areas in greater depth to ensure that you understand the application.

5. ASSESSMENT

General

You will be assessed through a combination of class tests, laboratory works and final examination. The distribution of marks and other details are given below. There will be three class tests ((on Aerodynamics, Propulsion and Flight) Dynamics), The students should carry out all their data and calculations and record them in his/her log book that will be used to assess the System and Flight simulation components.

5.1 Distribution of Marks

Flight Mechanics Component (worth 10% in total)	**Weighting**
Class Test	10%

Aerodynamics Component (worth 10% in total)	**Weighting**
Class Test	10%

Propulsion Component (worth 10% in total)	**Weighting**
Class Test	10%

Simulation Component (worth 10% in total)	**Weighting**
Logbook (Data Acquisition and solving Equations)/ZV to advise)	10%

System Component (worth 10% in total)	**Weighting**
Logbook (Based on Laboratory)/ZV to advise)	10%

Final Examination (worth 50% in total)	**Weighting**
Aerodynamics	12.5%
Propulsion	12.5%
Systems	12.5%
Flight Mechanics	12.5%

5.2 Details

5.2.a Class Tests:

NA will advise about the nature of the class test on Aerodynamics. Aerodynamics class test will be of 30 minutes duration in total.

JO will advise about the nature of the class test on Propulsion. Propulsion class test will be of 30 minutes duration in total.

NT will advise about the nature of the class test Flight Dynamics. Flight dynamics class test will be of 30 minutes duration in total.

5.2.b Assessment of Systems and Flight Simulation

(Laboratory Performance and Log book based)

The log book must be a bound exercise book containing the date of experiment, observations, notes, calculations, figures and comments by the student while conducting the experiment. **No loose sheets are acceptable**. All handouts related to a particul

The logbook must be handed in during lecture time, NOT through the school office. LATE Logbooks will NOT

Special Consideration and Supplementary Assessment

7. COURSE SCHEDULE

AVEN 2230

6	Experiment (Aerodynamics) Tyree Building LG 9 and 10	Aerodynamic Drag on Airfoil: 9-00am-9.40am : Groups 3,4 NA//YY/TF/BO 9.40-10.20am : Groups 5,6 NA/ YY/TF/BO 10.20-11.00am : Groups 1,2 NA/ YY/TF/BO		Experiment (Simulation) (F21)	9.00am-9.40am: Group 6 (Lab: F21) ZV/WC/MC 9.40am-10.20 am: Group 4 (Lab: F21) ZV/WC/MC 10.20 am-11.00am : Group5 (Lab: F21) ZV/WC/MC		WRAP-UP: (Aerodynamics)	ALL Groups 1-12 4pm-5pm NA/YY **CLASS TEST (AERODYNAMICS)**
7								

9	Lecture (Propulsion)	Thrust and efficiency-the trade off (JO)				Lecture (Propulsion)	Materials, Noise and Pollution (JO) **Class Test on Propulsion**
10	Lecture (Systems)	Hydraulic Systems and Components (ZV)		none		Lecture (Systems)	Pneumatic Systems and Components (ZV)
11	Lecture (Systems)	Electrical Systems and Components (ZV)		none		Lecture (Systems)	Fuel Systems and Components (ZV)
12	Experiment (Systems) Tyree Building LG 9 and 10	9am-9.40am : Groups 5,6 ZV/YE/TF 9.40am-10.20am : Groups 1,2 ZV/YE/TF 10.20am-11am: Groups 3,4 ZV/YE/TF				WRAP-UP	WRAP-UP Systems) ALL Groups 1-12 **LOGBOOK DUE (Systems/Simulation)**

13	Revision (Any Topic, If needed) NA/JO/NT/ZV	ALL Groups 1-12 ZV/YE		none		Revision (Any Topic, If needed) NA/JO/NT/ZV	ALL Groups 1-12

Lecturers: JO John Olsen NA N.A.Ahmed
NT Naomi Tsafnat ZV Zoran Vulovic

Demonstrators/Demonstrators: MC Monica Chee YE Yendrew Yauwenas
YY Yong Ying Zheng WC William Crowe

Laboratory Officer: TF Terry Flynn BO Bruce Oliver

The schedules shown may be subject to change at short notice to suit exigencies.

The Simulation Experiments will be held building F21
(Engineering Simulation Laboratory).

The Aerodynamic laboratory Inspections/demonstrations and system experiments will be held in G19/Tyree building (Please check before you go)

The Systems Experiments will be held in Tyree Building

10. ADMINISTRATIVE MATTERS

You are expected to have read and be familiar with *Administrative Matters*, available on the School website. This document contains important information on student responsibilities and support, including special consideration, assessment, health and safety, and student equity and diversity.

N. A. Ahmed
February 2015