UNSW Course Outline

ZEIT1802 Aircraft Systems for Aviators - 2024

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General Course Information

Course Code : ZEIT1802
Year : 2024
Term : Semester 2
Teaching Period : Z2
Is a multi-term course? : No
Faculty : UNSW Canberra
Academic Unit : UC Science
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : UNSW Canberra at ADFA
Campus : UNSW Canberra
Study Level : Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

This course explores the purpose and general arrangement of aircraft systems and propulsive technologies. The role of the operator - pilot or engineer - will be discussed with reference to the concept of integrated aircraft system design and function for manned and unmanned aircraft.

Systems covered include engines, propellers, fuel, electrical, hydraulic, pneumatic, environmental control, navigation, undercarriage, and braking.

Course Aims

This course aims to provide aviators with a generic knowledge of aircraft systems so that during their flying careers they are able to more effectively apply aircraft systems knowledge to standard operating procedures, commumicate with their peers and maintainers of their aircraft, apply knowledge-based problem-solving skills and to make the transition from one type of aircraft to another with ease and alacrity.

Relationship to Other Courses

While there is no prerequisite for this course, there will be some assumed knowledge in terms of fundamental high school mathematics and physics. Any assumed knowledge will be revised prior to its use as needed. As such, this course is suitable for any and all students.

This course provides knowledge about aircraft systems, providing a direct link to further courses such as *Aircraft and Systems Design, Air Traffic Management, Airport Operations and Systems*, and the final year thesis.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Describe an aircraft system
CLO2 : Be able to integrate the knowledge of that system into the architecture of the aircraft
CLO3 : Investigate an accident or incident involving an aircraft system as a casual factor
CLO4 : Be able to effectively communicate the above to their class peers

Course Learning Outcomes	Assessment Item
CLO1 : Describe an aircraft system	• Final Exam • Laboratory Work • Research Discussions • Weekly Quiz
CLO2 : Be able to integrate the knowledge of that system into the architecture of the aircraft	• Final Exam • Laboratory Work • Weekly Quiz
CLO3 : Investigate an accident or incident involving an aircraft system as a casual factor	• Research Discussions • Final Exam
CLO4 : Be able to effectively communicate the above to their class peers	• Research Discussions

Learning and Teaching Technologies

Moodle - Learning Management System

Learning and Teaching in this course

Weekly course readings and lecture notes will be placed on Moodle throughout the session.

Additional Course Information

Program Learning Outcomes

This course contributes to the following Program Learning Outcomes of the *Bachelor of Science*:

PLO1. Demonstrate a broad and deep theoretical and technical knowledge of their scientific disciplines.

PLO2. Demonstrate the technical skills required by their discipline including problem solving, field work, and experimental laboratory work.

PLO3. Be able to create new concepts and understanding through the process of scientific inquiry, critical analysis, problem solving, and research.

PLO4. Be able to take responsibility for and demonstrate commitment to their own learning, motivated by curiosity and an appreciation of the value of lifelong learning.

PLO9. Make appropriate and effective use of information and information technology relevant to their discipline.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Final Exam Assessment Format: Individual	30%	Start Date: Not Applicable Due Date: Not Applicable
Laboratory Work Assessment Format: Individual	20%	Start Date: Not Applicable Due Date: Not Applicable
Research Discussions Assessment Format: Individual	30%	Start Date: Not Applicable Due Date: Not Applicable
Weekly Quiz Assessment Format: Individual	20%	Start Date: Not Applicable Due Date: Not Applicable

Assessment Details

Final Exam

Assessment Overview

Summative final examination held in the official exam period, closed book, pen and paper, emulating the industry standard as set by CASA, with extensions for the university level of the course.

Course Learning Outcomes

- CLO1 : Describe an aircraft system
- CLO2 : Be able to integrate the knowledge of that system into the architecture of the aircraft
- CLO3 : Investigate an accident or incident involving an aircraft system as a casual factor

Detailed Assessment Description

Further details, including a practice exam will be available through Moodle.

Assessment Length

NA

Submission notes

Pen and paper

Assessment information

All additional information relevant will be provided through Moodle.

Assignment submission Turnitin type

Not Applicable

Generative AI Permission Level

Not Applicable

Generative AI is not considered to be of assistance to you in completing this assessment. If you do use generative AI in completing this assessment, you should attribute its use.
For more information on Generative AI and permitted use please see here.

As a closed book pen and paper exam, the use of AI will not be possible.

Laboratory Work

Assessment Overview

Students will participate in a laboratory program in the Aviation Simulation Lab. This will involve in class practical activities drawn from across the aviation domain, include conventional, uncrewed, and space flight, as well as the use of AR and VR technologies. Some prelab activities will be required in preparation for the in class activities, and a worksheet will be required at the completion of the various activities along with the submission of logs and outputs relevant to the activity.

Course Learning Outcomes

- CLO1 : Describe an aircraft system
- CLO2 : Be able to integrate the knowledge of that system into the architecture of the aircraft

Detailed Assessment Description

All details of the laboratory activities will be provided through the course Moodle. In principle, you will participate in 5 or 6 fortnightly lab activities, each to be completed in the 2 hour laboratory sessions.

Assessment Length

NA

Submission notes

Data files and worksheets will be uploaded to Moodle.

Assessment information

All additional information relevant will be provided through Moodle.

Assignment submission Turnitin type

Not Applicable

Generative AI Permission Level

Not Applicable

Generative AI is not considered to be of assistance to you in completing this assessment. If you do use generative AI in completing this assessment, you should attribute its use.
For more information on Generative AI and permitted use please see here.

The use of AI is not applicable to this assessment item as it does not generate any document artiffacts, and is just performance based lab work.

Research Discussions

Assessment Overview

Submit regular discussions in the course Moodle for the specified topic. You will be required to submit one original contribution and replies each fortnight. Each original contribution is required to be supported by scholarly references and official reports, and all critical replies must be supported by references. An official report should cover the aviation safety occurrence that is the topic of the submission. The original contribution will be approximately 250 to 300 words, with each reply will be 50 to 100 words. Replies should be either critical (but courteous) checking the facts presented, expanding on the information presented, or comparing and contrasting the topic to your original. The intent of the assessment item is to contextualise aircraft systems and the role they play in aviation safety, while utilising official sources of information supported by the scientific literature, all in the form of a scientific discussion. The overall topic of the research discussion will be “Aviation Safety Occurrences Involving Aircraft Systems”.

Course Learning Outcomes

- CLO1 : Describe an aircraft system
- CLO3 : Investigate an accident or incident involving an aircraft system as a casual factor
- CLO4 : Be able to effectively communicate the above to their class peers

Detailed Assessment Description

All detailed information relevant will be provided through Moodle. This includes the marking rubric and details of the standard expected etc.

Assessment Length

3000 words total, across 6 fortnights.

Submission notes

Each forum will be submitted fortnightly through the discussion board in the course Moodle.

Assessment information

All additional information relevant will be provided through Moodle.

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students can see Turnitin similarity reports.

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.

Weekly Quiz

Assessment Overview

Each week, a quiz will be completed. The quiz content will be drawn from the material presented in the previous week. This will typically consist of 6 to 8 questions.

Course Learning Outcomes

- CLO1 : Describe an aircraft system
- CLO2 : Be able to integrate the knowledge of that system into the architecture of the aircraft

Detailed Assessment Description

All detailed information relevant will be provided through Moodle.

Assessment Length

NA

Submission notes

Weekly pen and paper quiz. Hard copy submission.

Assessment information

All additional information relevant will be provided through Moodle.

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.

General Assessment Information

Marks:

All marks obtained for assessment items during the session are provisional. The final mark as published by the university following the assessment review group meeting is **the only official mark.**

Early Assessments:

By week 4, students will have marks and feedback for the first research forum, 3 of the in class quizzes, and the first lab activity.

Generative AI:

You can use generative AI software in this assessment to the extent specified in the assessment instructions. Any output of generative software within your assessment must be attributed with

full referencing.
If the outputs of generative AI such as ChatGPT form part of your submission and is not appropriately attributed, it will be regarded as serious academic misconduct and subject to the standard penalties, which may include 00FL, suspension and exclusion.
* To cite: OpenAI (Year Accessed). ChatGPT. OpenAI. https://openai.com/models/chatgpt/
* Please note that the outputs from these tools are not always accurate, appropriate, nor properly referenced. You should ensure that you have moderated and critically evaluated the outputs from generative AI tools such as ChatGPT before submission.

Grading Basis

Standard

Requirements to pass course

Achieve a composite mark of at least 50 out of 100.

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 15 July - 19 July	Module	Electrical Fundamentals
Week 2 : 22 July - 26 July	Module	Electrical Power Generation and Distribution
Week 3 : 29 July - 2 August	Module	Communication Systems
Week 4 : 5 August - 9 August	Module	Aircraft Instrumentation
Week 5 : 12 August - 16 August	Module	Navigation Systems
Week 6 : 19 August - 23 August	Module	RADAR and ILS
Week 7 : 9 September - 13 September	Module	Flight Control Systems
Week 8 : 16 September - 20 September	Module	Avionics and Cockpit Systems
Week 9 : 23 September - 27 September	Module	Warning and Recording Systems
Week 10 : 30 September - 4 October	Module	Mechanical Fundamentals
Week 11 : 7 October - 11 October	Module	Pneumatic Systems
Week 12 : 14 October - 18 October	Module	Hydraulic Systems
Week 13 : 21 October - 25 October	Module	Revision and Exam Prep

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

General Schedule Information

Each week will contain a module that covers one or two topics. The topic content will be covered in the two weekly lectures, which will be summaried with tutorial questions for student reflection and self assessment.

The Schedule provided here is a draft, and is subject to change due to availability of guest lecturers who can be senior Defence Force personnel.

Wednesday of Wk 8 and Thursday of Wk 11 are lost (for lecturers), along with Monday and Friday of Wk 11 (for labs).

Course Resources

Prescribed Resources

There is no set textbook for this course.

Recommended Resources

Moir, I., & Seabridge, A., 2008. Aircraft systems: mechanical, electrical and avionics subsystems integration, 3rd Ed., John Wiley & Sons Ltd, Chichester.

Austin, R., 2010. Unmanned aircraft systems: UAVs design, development & deployment, John Wiley & Sons Ltd, Chichester.

Lombardo, D. 1993, Advanced aircraft systems, TAB Books, Blue Ridge Summit, PA.

Additional Costs

None.

Course Evaluation and Development

One of the key priorities in the 2025 Strategy for UNSW is a drive for academic excellence in education. One of the ways of determining how well UNSW is progressing towards this goal is by listening to our own students. Students will be asked to complete the myExperience survey towards the end of this course.

Students can also provide feedback during the semester via: direct contact with the lecturer, the “On-going Student Feedback” link in Moodle, Student-Staff Liaison Committee meetings in schools, informal feedback conducted by staff, and focus groups. Student opinions really do make a difference. Refer to the Moodle site for this course to see how the feedback from previous students has contributed to the course development.

Important note: Students are reminded that any feedback provided should be constructive and professional and that they are bound by the Student Code of Conduct Policy

https://www.gs.unsw.edu.au/policy/documents/studentcodepolicy.pdf

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Graham Wild		B26 Rm119	0251145221	email	No	Yes
Lab staff	Alexander Somerville		B26 Rm120	NA	email	No	No