UNSW Course Outline

AVIA3112 Air Transport Aerodynamics and Aircraft Systems - 2024

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General Course Information

Course Code : AVIA3112
Year : 2024
Term : Term 2
Teaching Period : T2
Is a multi-term course? : No
Faculty : Faculty of Science
Academic Unit : School of Aviation
Delivery Mode : In Person
Delivery Format : Non Standard
Delivery Location : Bankstown
Campus : Sydney
Study Level : Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

This course introduces students to the aeronautical knowledge training required by the CASR

1998 Part 61 MOS for the Air Transport Pilot Licence level Aerodynamics and Aircraft Systems, specifically the AAGC and AAGA units of competency.

The course explores key concepts of air transport aerodynamics, and aircraft systems, with a focus on the components, methods of operation and indications relating to transport aeroplane systems, and the relationship between theoretical aerodynamic concepts and practice systems in various operational contexts. A combination of synchronous learning and discussion is used to teach key concepts, knowledge and skills, and homework and class quizzes are also provided to students to assess retention and understanding of their learning.

Course Aims

The aim of this course is to help students achieve the aeronautical knowledge requirements in relation to aerodynamics and aircraft systems for the issue of an Australian Air Transport Pilot Licence. The course aims to support students' acquisition of necessary skills and knowledge through a combination of learning delivery styles and resources, including a series of collaborative lecture presentations integrating relevant reference material, videos, and quizzes, followed by discussion involving challenge, response-style questioning. To ensure that students feel supported prior to sitting the mandatory CASA examination for this course and are confident in their understanding of the required knowledge, preparatory support and knowledge checks with feedback provided on each student's performance are integrated throughout the course.

The standards achieved are to meet or exceed those laid down by the Civil Aviation Safety Authority as per the UNSW Operations Manual.

Relationship to Other Courses

Pre-requisite(s) AVIA 2111, AVIA2112, AVIA2113, AVIA2114,AVIA2115,AVIA2116 & AVIA2117.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Explain the components, method of operation and applicable cockpit indications in relation to transport aeroplane systems.
CLO2 : Relate theoretical concepts to the practical systems information found in transport aeroplane Aircraft Flight Manuals.
CLO3 : Define and explain aerodynamic concepts applicable to high-speed propeller and jet aeroplanes.
CLO4 : Relate theoretical aerodynamic concepts to design features, controls and limitations found in high-speed propeller and jet aeroplanes.
CLO5 : Satisfy the theoretical knowledge requirements of the CASR 1998 Part 61 MOS for the AAGC and AAGA units of competency.

Course Learning Outcomes	Assessment Item
CLO1 : Explain the components, method of operation and applicable cockpit indications in relation to transport aeroplane systems.	• Comprehensive knowledge check • Air transport pilot licence aerodynamics and aircraft systems (aeroplane) exam (CASA AASA)
CLO2 : Relate theoretical concepts to the practical systems information found in transport aeroplane Aircraft Flight Manuals.	• Comprehensive knowledge check • Air transport pilot licence aerodynamics and aircraft systems (aeroplane) exam (CASA AASA)
CLO3 : Define and explain aerodynamic concepts applicable to high-speed propeller and jet aeroplanes.	• Comprehensive knowledge check • Air transport pilot licence aerodynamics and aircraft systems (aeroplane) exam (CASA AASA)
CLO4 : Relate theoretical aerodynamic concepts to design features, controls and limitations found in high-speed propeller and jet aeroplanes.	• Comprehensive knowledge check • Air transport pilot licence aerodynamics and aircraft systems (aeroplane) exam (CASA AASA)
CLO5 : Satisfy the theoretical knowledge requirements of the CASR 1998 Part 61 MOS for the AAGC and AAGA units of competency.	• Comprehensive knowledge check • Air transport pilot licence aerodynamics and aircraft systems (aeroplane) exam (CASA AASA)

Learning and Teaching Technologies

Moodle - Learning Management System

Additional Course Information

The course is planned to be delivered face-to-face at the Flying Operations Unit, with supporting

online documentation, resources, and assessment tasks available on UNSW Moodle. Students are expected to self-study prior to commencement of this course by familiarising themselves with the course content available on Moodle.

This subject lends itself to face-to-face teaching as there are many concepts and calculations that are best explained using the classroom whiteboard, therefore classroom attendance is compulsory.

Teaching in this course includes an intensive series of lecture presentations, scenario-based problem- solving exercises and formal CASA exam preparation.

The scope of the material is vast, so the initial part of the course requires a lecture style approach, using media and references to source regulatory publications as appropriate. Once the foundational knowledge is highlighted, scenario-based problems are discussed and solved for each topic area.

A supportive and collegiate environment is provided but there is an expectation that all students will take responsibility for their own learning and progress within the course. Assessment is designed to reflect the learning outcomes.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Comprehensive knowledge check Assessment Format: Individual	50%	Start Date: Day 10 Due Date: Day 10
Air transport pilot licence aerodynamics and aircraft systems (aeroplane) exam (CASA AASA) Assessment Format: Individual	50%	Start Date: As per your individual CASA confirmation slip Due Date: No Later than the last day of the exam period, for the applicable term of enrolment

Assessment Details

Comprehensive knowledge check

Assessment Overview

For the Comprehensive Knowledge Check assessment, you are required to undertake a test on Day 10. The test will comprise of short answer questions covering material from Days 1-8.

You will be provided with 150 minutes to complete the test.

General feedback on student performance with an emphasis on identified problem areas will also be provided verbally by the instructor in the class following the comprehensive knowledge check submission deadline.

Course Learning Outcomes

- CLO1 : Explain the components, method of operation and applicable cockpit indications in relation to transport aeroplane systems.
- CLO2 : Relate theoretical concepts to the practical systems information found in transport aeroplane Aircraft Flight Manuals.
- CLO3 : Define and explain aerodynamic concepts applicable to high-speed propeller and jet aeroplanes.
- CLO4 : Relate theoretical aerodynamic concepts to design features, controls and limitations found in high-speed propeller and jet aeroplanes.
- CLO5 : Satisfy the theoretical knowledge requirements of the CASR 1998 Part 61 MOS for the AAGC and AAGA units of competency.

Detailed Assessment Description

50 short answer questions covering all topics, to be completed after the course is delivered but before the CASA examination.

Assessment Length

150 mins

Submission notes

Online Moodle Assessment examination given on a date notified in class, held on a regular scheduled class day, and set between certain times.

Assessment information

This assessment task is designed to cover the topic areas, with questions to represent the scope of the Civil Aviation Safety Authority examination, required by the CASR 1998 Part 61 MOS for the grant of a Airline Transport Pilot Licence specifically AAGC and AAGA units of competency.

Assignment submission Turnitin type

This is not a Turnitin assignment

Air transport pilot licence aerodynamics and aircraft systems (aeroplane) exam (CASA AASA)

Assessment Overview

For this assessment, you are required to complete a federally mandated examination conducted by the aviation regulator (CASA) external to UNSW. The exam will test your knowledge of the syllabus in Part 61 Manual of Standards (MOS) schedule 3. The exam comprises of multiple-choice questions and numerical entry questions.

You will be provided with 90 minutes to complete the examination. Feedback will be provided immediately after the examination via the Knowledge Deficiency Report (KDR).

As the flying training is conducted under Civil Aviation Safety Regulation 1998 Part 142 approval, students must not arrange, transfer, or sit exams without Head of Operations approval. All first attempts at exams will be arranged by UNSW.

You must provide the original CASA result (KDR) notification to the Head of Operations as evidence that you have passed a CASA exam within the time allowed. Students who do not hand in the KDR and subsequently lose the original copy will be liable to purchase a replacement from CASA at their own expense.

The mark to pass this examination is a minimum of 70%. Failure to attempt or pass this assessment will result in the award of a UF grade, irrespective of the final mark.

Course Learning Outcomes

- CLO1 : Explain the components, method of operation and applicable cockpit indications in relation to transport aeroplane systems.
- CLO2 : Relate theoretical concepts to the practical systems information found in transport aeroplane Aircraft Flight Manuals.
- CLO3 : Define and explain aerodynamic concepts applicable to high-speed propeller and jet aeroplanes.
- CLO4 : Relate theoretical aerodynamic concepts to design features, controls and limitations found in high-speed propeller and jet aeroplanes.
- CLO5 : Satisfy the theoretical knowledge requirements of the CASR 1998 Part 61 MOS for the AAGC and AAGA units of competency.

Detailed Assessment Description

A federally mandated examination conducted by the aviation regulator external to UNSW, required for pilots to achieve a Airline Transport Pilot Licence.

Feedback is generated by the regulator immediately at the conclusion of the exam in accordance with legislation.

Assessment Length

90 mins

Submission notes

You must provide the original CASA result notification, also known as the KDR, (pass or fail) to the Head of Operations immediately after sitting the CASA examination. Students who do not hand in the KDR and subsequently lose the original copy will be liable to purchase a replacement from CASA at their own expense.

Assessment information

This is an external industry examinatiion, one of seven exams required for the commercial pilot licence. The examination will be conducted by ASPEQ Limited. Students must be familiar with CASA exam rules at:

https://www.casa.gov.au/licences-and-certificates/pilots/pilot-and-flight-crew-exams/prepare-your-exam

As the flying training is conducted under Civil Aviation Safety Regulation 1998 Part 142 approval, students must not arrange, transfer, or sit CASA exams without Head of Operations approval. All first attempts at exams will be arranged by UNSW.

Assignment submission Turnitin type

This is not a Turnitin assignment

Hurdle rules

Assessment task 2 is an essential component of the course. **Failure to attempt or pass assessment 2 will result in the award of a UF grade for AVIA 3112.**

If a student does not pass assessment task 2 at the frst attempt, then the result for AVIA 3112 will be capped at 50% regardless of performance in the other assessment tasks, provided the student subsequently passes assessment task 2 within the time allowed. Assessment task 2 must be satisfactory completed no later than the last day of the applicable exam period following the term AVIA3112 was enrolled in. The last day of the exam period is determined by the published UNSW academic calandar available at https://www.student.unsw.edu.au/calendar

General Assessment Information

Your final mark for AVIA 3112 will be determined using the weightings shown for each assessment task. Your mark will be moderated so that a result of between 70% to 100% in each assessment task will equate to a moderated result of 50% to 100% for AVIA 3112.

If a student does not pass asssessment task 3 at the first attempt, then the result for AVIA 3112 will be capped at 50% regardless of the performance in the other assessment tasks, provided the student subsequently passes assessment task 3 within the time allowed.

Grading Basis

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Week Commencing 27 May 2024	Lecture	Day 1 PPT: (1) Review of Terminology PPT: (2) Aerodynamic Forces PPT: (3) Shock Waves PPT: (4) Performance & Speed PPT: (5) Performance & Altitude Day 2 PPT: (6) Flight Controls (a) PPT: (7) Flight Controls (b) PPT: (8) Landing Gear (a) PPT: (9) Landing Gear (b) Day 3 PPT: (10) Actuating Systems PPT: (11) Air Conditioning PPT: (12) Pressurisation PPT: (13) Ice & Rain Detection PPT: (14) Fuel Systems Day 4 PPT: (15) DC Electrics (a) PPT: (16) DC Electrics (b) PPT: (17) DC Electrics (c) PPT: (18) DC Electrics (d) PPT: (19) DC Electrics (e) PPT: (20) DC Electrics (f) Day 5 PPT: (21) AC Electrics (a) PPT: (22) AC Electrics (b) PPT: (23) AC Electrics (c) PPT: (24) Power Plants Turbine Engine – (a) Introduction
Week Commencing 03 June 2024	Lecture	Day 6 PPT: (25) Power Plants Turbine Engine – (b) Air Intakes PPT: (26, 27) Power Plants Turbine Engine – (c) Compressors PPT: (28) Power Plants Turbine Engine – (d) Combustion Chambers PPT: (29) Power Plants Turbine Engine – (e) Turbine Assembly PPT: (30) Power Plants Turbine Engine – (f) Exhaust Systems Day 7 PPT: (31) Power Plants Turbine Engine – (g) Thrust Augmentation PPT: (32) Power Plants Turbine Engine – (h) APU PPT: (33) Power Plants Turbine Engine – (i) Reverse Thrust PPT: (34) Power Plants Turbine Engine – (j) Performance PPT: (35) Power Plants Turbine Engine – (k) Bleed Air, Gear Boxes & Accessory Drives) Day 8 PPT: (36) Power Plants Turbine Engine – (l) Ignition Systems PPT: (37) Power Plants Turbine Engine – (m) Engine Starting PPT: (38) Displays (EICAS) PPT: (39) Engine Instruments Day 9 Whiteboard: Radio Frequency Bands PPT: (40) EFIS PPT: (41) Flight Management Systems (FMS) PPT: (42) Auto Pilot (AP) Day 10 PPT: (43) Ground Proximity Warning System (GPWS) PPT: (44) Traffic Collision Avoidance System (TCAS) PPT: (45) Warning Systems (general) PPT: (46) Cockpit Voice Recorder (CVR)

Attendance Requirements

Attendance at each class is compulsory. If a student is absent due to illness or misadventure, medical or other certification that explains and covers the period of the absence must be submitted to the class lecturer.
Unexplained and/or unsupported absences from classes may result in a review of the student's enrolment as per the Professional Pilot Program Procedures Manual and may result in a fail grade awarded for AVIA 3112.

General Schedule Information

This course is programed as an intensive course, as such it is 5 days per week. (A minimum of 6 contact hours per day) over 2 weeks for 10 days = 60 contact hours.

The subject is conducted face-to-face at the FOU, and class times start at 0830 and go to 1550, although this may extend to a later time dependant on student questions and queries

Course Resources

Prescribed Resources

A comprehensive series of online notes and practice questions are available to students on Moodle. All handouts, quizzes and reviews are within the respective Molodle folders.

Access to UNSW Moodle is through the following link and student key

ATPL Aerodynamics and Systems

FOUAK - ATPL - SYS (unsw.edu.au)

FOUAK_ATPL_SYS_STD_2020

Recommended Resources

The following textbook and resources are provided for enrolled students

- *Students will be provided with the online version of the Boeing 767-300ER Operations Manual extract (CASA).*
- *The Australian ATPL (Aeroplane) Examination Information Book Version 2.6 is relevant and is located for download at URL:* file:///C:/Users/z3387908/Downloads/australian-air-transport-pilot-licence-examination-information-book-aeroplane (1).pdf

- *UNSW Operations Manual and CASR 1998 Part 61 MOS, AAGC and AAGA units of competency*
- *A comprehensive series of online notes will be supplied to students for the course*

Course Evaluation and Development

Assessment 1 feedback will be given verbally by the ATPL lecturer within 2 days of the assessment and before the CASA exam.

Assessment 2 (CASA exam) feedback is given immediately after the exam via a printed Knowledge Deficiency Report.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Lecturer	Neil Windle		Flying Operations Unit	02 9791 3047	By appointment	Yes	Yes
Head lecturer	Jeremy Andrews		Flying Operations Unit	02 9791 3047	By appointment	No	No

Other Useful Information

Academic Information

Upon your enrolment at UNSW, you share responsibility with us for maintaining a safe, harmonious and tolerant University environment.

You are required to:

- Comply with the University's conditions of enrolment.
- Act responsibly, ethically, safely and with integrity.
- Observe standards of equity and respect in dealing with every member of the UNSW community.
- Engage in lawful behaviour.
- Use and care for University resources in a responsible and appropriate manner.
- Maintain the University's reputation and good standing.

For more information, visit the UNSW Student Code of Conduct Website.

Academic Honesty and Plagarism

Referencing is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism.
Further information about referencing styles can be located at https://student.unsw.edu.au/referencing

Academic integrity is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits: honesty, trust, fairness, respect, responsibility and courage. At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.
Further information about academic integrity, plagiarism and the use of AI in assessments can be located at:

- The Current Students site,
- The ELISE training site, and
- The Use of AI for assessments site.

The Student Conduct and Integrity Unit provides further resources to assist you to understand your conduct obligations as a student: https://student.unsw.edu.au/conduct

Submission of Assessment Tasks

Penalty for Late Submissions
UNSW has a standard late submission penalty of:

- 5% per day,
- for all assessments where a penalty applies,
- capped at five days (120 hours) from the assessment deadline, after which a student cannot submit an assessment, and
- no permitted variation.

Any variations to the above will be explicitly stated in the Course Outline for a given course or assessment task.

Students are expected to manage their time to meet deadlines and to request extensions as early as possible before the deadline.

Special Consideration

If circumstances prevent you from attending/completing an assessment task, you must officially apply for special consideration, usually within 3 days of the sitting date/due date. You can apply by logging onto myUNSW and following the link in the My Student Profile Tab. Medical documentation or other documentation explaining your absence must be submitted with your application. Once your application has been assessed, you will be contacted via your student email address to be advised of the official outcome and any actions that need to be taken from there. For more information about special consideration, please visit: https://student.unsw.edu.au/special-consideration

Important note: UNSW has a "fit to sit/submit" rule, which means that if you sit an exam or submit a piece of assessment, you are declaring yourself fit to do so and cannot later apply for Special Consideration. This is to ensure that if you feel unwell or are faced with significant circumstances beyond your control that affect your ability to study, you do not sit an examination or submit an assessment that does not reflect your best performance. Instead, you should apply for Special Consideration as soon as you realise you are not well enough or are otherwise unable to sit or submit an assessment.

Faculty-specific Information

Additional support for students

- The Current Students Gateway
- Student Support
- Academic Skills and Support
- Student Wellbeing, Health and Safety
- Equitable Learning Services
- UNSW IT Service Centre
- Science EDI Student Initiatives, Offerings and Guidelines

School Contact Information

Email:

aviation@unsw.edu.au

Telephone:

Undergraduate Courses - +61 2 9385 5756 (Katie Wang)

Postgraduate Courses - +61 2 9385 5787 (Michelle Lee)