



UNSW Course Outline

AVIA1111 Aeronautical Knowledge - 2024

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General Course Information

Course Code : AVIA1111

Year : 2024

Term : Term 3

Teaching Period : T3

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 : Kensington

Campus : Sydney

Study Level : Undergraduate

Units of Credit : 12

Useful Links

[Handbook Class Timetable](#)

Course Details & Outcomes

Course Description

This course is designed for students with no prior aviation flight experience who are required to undertake the integrated Commercial Pilot Licence. Through the use of face-to-face lectures and instruction, students will undertake all aeronautical knowledge training required by the CASR

1998 Part 61 MOS for Recreational Pilot Licence Level, Basic Aeronautical Knowledge (BAK). The training specifically covers the BAKC, RBKA, RFRC, RMTC, PNVC and PHFC units of competency.

Course Aims

The aim of this course is to introduce students to the foundations of aeronautical knowledge required for commencing their Commercial Pilot Licence training. The course will provide students with the opportunity to build necessary core skills and knowledge required for the Bachelor of Aviation (Flying) program and in general, for embarking on a successful career in aviation.

Relationship to Other Courses

AVIA1111 is a pre-requisite to AVIA2111, AVIA2112, AVIA2113, AVIA2114 AVIA2115 and AVIA2116. It is also a pre-requisite to commence practical flight training the following January in the Bachelor of Aviation (Flying) program, and the Bachelor of Aviation (RPAS) program.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Maintain, interpret and apply the relevant regulatory references to safely conduct Day Visual Flight Rules private flight operations for the issue of a Recreational Pilot Licence.
CLO2 : Define and explain basic aerodynamic concepts and describe how these apply to single engine aeroplanes in flight.
CLO3 : Explain the components, method of operation and applicable cockpit indications in relation to single engine aeroplane systems
CLO4 : Define and explain basic meteorological concepts and describe their effect on flight.
CLO5 : Calculate take-off and landing performance and determine weight and balance solutions using typical performance and loading systems.
CLO6 : Define and explain basic human factors problems that affect day VFR flying.
CLO7 : Define and apply visual navigation concepts to day flying and calculate solutions to navigation problems after interpreting navigation data.
CLO8 : Satisfy the theoretical knowledge requirements of the CASR 1998 Part 61 MOS for the BAKC, RBKA, RFRC, RMTC, PNVC and PHFC units of competency.

Course Learning Outcomes	Assessment Item
CLO1 : Maintain, interpret and apply the relevant regulatory references to safely conduct Day Visual Flight Rules private flight operations for the issue of a Recreational Pilot Licence.	<ul style="list-style-type: none"> • Foundation knowledge test 4 • CASA Recreational Pilot Licence (Aeroplane) Exam
CLO2 : Define and explain basic aerodynamic concepts and describe how these apply to single engine aeroplanes in flight.	<ul style="list-style-type: none"> • Foundation knowledge test 1 • CASA Recreational Pilot Licence (Aeroplane) Exam
CLO3 : Explain the components, method of operation and applicable cockpit indications in relation to single engine aeroplane systems	<ul style="list-style-type: none"> • Foundation knowledge test 2 • CASA Recreational Pilot Licence (Aeroplane) Exam
CLO4 : Define and explain basic meteorological concepts and describe their effect on flight.	<ul style="list-style-type: none"> • Foundation knowledge test 2 • CASA Recreational Pilot Licence (Aeroplane) Exam
CLO5 : Calculate take-off and landing performance and determine weight and balance solutions using typical performance and loading systems.	<ul style="list-style-type: none"> • Foundation knowledge test 3 • CASA Recreational Pilot Licence (Aeroplane) Exam
CLO6 : Define and explain basic human factors problems that affect day VFR flying.	<ul style="list-style-type: none"> • Foundation knowledge test 4 • CASA Recreational Pilot Licence (Aeroplane) Exam
CLO7 : Define and apply visual navigation concepts to day flying and calculate solutions to navigation problems after interpreting navigation data.	<ul style="list-style-type: none"> • Foundation knowledge test 1 • Foundation knowledge test 3 • CASA Recreational Pilot Licence (Aeroplane) Exam
CLO8 : Satisfy the theoretical knowledge requirements of the CASR 1998 Part 61 MOS for the BAKC, RBKA, RFRC, RMTC, PNVC and PHFC units of competency.	<ul style="list-style-type: none"> • CASA Recreational Pilot Licence (Aeroplane) Exam

Learning and Teaching Technologies

Moodle - Learning Management System

Learning and Teaching in this course

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

BAKC, RBKA, RFRC, RMTC, PNVC and PHFC units of competency provide a foundational base for future advanced studies. The material presented is critical to flight safety and must be thoroughly understood by all pilots every day of their career. The intensive mode of delivery and rigorous treatment of the material reflects this importance.

Given the very specific and difficult nature of the formal CASA exam, formal exam preparation is necessary.

A supportive 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
Foundation knowledge test 1 Assessment Format: Individual	15%	
Foundation knowledge test 2 Assessment Format: Individual	15%	
Foundation knowledge test 3 Assessment Format: Individual	15%	
Foundation knowledge test 4 Assessment Format: Individual	15%	
CASA Recreational Pilot Licence (Aeroplane) Exam Assessment Format: Individual	40%	

Assessment Details

Foundation knowledge test 1

Assessment Overview

You will be required to complete an in-person test on Day 5. The test will be comprised of both short answer questions and multiple-choice questions. You will be given 150 minutes to complete the test. This test will assess your understanding and skills in CR2 Navigation Computer calculations and Aerodynamics. Verbal feedback will be provided by the lecturer in class following the examination. The pass mark for this knowledge test is 70%.

Course Learning Outcomes

- CLO2 : Define and explain basic aerodynamic concepts and describe how these apply to single engine aeroplanes in flight.
- CLO7 : Define and apply visual navigation concepts to day flying and calculate solutions to navigation problems after interpreting navigation data.

Assessment Length

150 mins

Submission notes

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

Assignment submission Turnitin type

This is not a Turnitin assignment

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](#).

Foundation knowledge test 2

Assessment Overview

You will be required to complete an in-person test on Day 11. The test will be comprised of both short answer questions and multiple-choice questions. You will be given 120 minutes to complete the test. This test will assess your understanding and skills in Aircraft General Knowledge (Systems) and Meteorology. Verbal feedback will be provided by the lecturer in class following the examination. The pass mark for this knowledge test is 70%.

Course Learning Outcomes

- CLO3 : Explain the components, method of operation and applicable cockpit indications in relation to single engine aeroplane systems
- CLO4 : Define and explain basic meteorological concepts and describe their effect on flight.

Assessment Length

120 mins

Submission notes

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

Assignment submission Turnitin type

This is not a Turnitin assignment

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.

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Foundation knowledge test 3

Assessment Overview

You will be required to complete an in-person test on Day 17. The test will be comprised of both short answer questions and multiple-choice questions. You will be given 120 minutes to complete the test. This test will assess your understanding and skills in Performance Loading, and Navigation. Verbal feedback will be provided by the lecturer in class following the examination. The pass mark for this knowledge test is 70%.

Course Learning Outcomes

- CLO5 : Calculate take-off and landing performance and determine weight and balance solutions using typical performance and loading systems.
- CLO7 : Define and apply visual navigation concepts to day flying and calculate solutions to navigation problems after interpreting navigation data.

Assessment Length

120 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.

Assignment submission Turnitin type

This is not a Turnitin assignment

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.

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Foundation knowledge test 4

Assessment Overview

You will be required to complete an in-person test on Day 20 . The test will be comprised of multiple-choice questions set by the aviation regulator. You will be given 150 minutes to complete the test. This test will assess your understanding and skills in Flight Rules and Air Law, and Human Factors. Written feedback will be provided via a formal knowledge deficiency report upon completion of the test. This is a hurdle assessment, and a pass is required to successfully complete the course. The pass mark for this knowledge test is 70%.

Course Learning Outcomes

- CLO1 : Maintain, interpret and apply the relevant regulatory references to safely conduct Day Visual Flight Rules private flight operations for the issue of a Recreational Pilot Licence.
- CL06 : Define and explain basic human factors problems that affect day VFR flying.

Assessment Length

150 mins

Submission notes

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

Assignment submission Turnitin type

This is not a Turnitin assignment

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](#).

CASA Recreational Pilot Licence (Aeroplane) Exam

Assessment Overview

You will be required to complete the RPLA final examination on Day 21 comprised of multiple-choice questions set by the aviation regulator. The examination will assess all content covered in the AVIA1111 course. The duration of the examination is 120 Mins.

Written feedback will be provided via the formal knowledge deficiency report upon completion of the examination by the federal regulator.

As the flying training is conducted under Civil Aviation Safety Regulation 1998 Part 142 approval, you 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 notification to the Head of Operations as evidence that you have passed a CASA exam within the time allowed.

This is a hurdle examination, and a pass is required to successfully complete the course. The pass mark for this examination is 70%.

Course Learning Outcomes

- CLO1 : Maintain, interpret and apply the relevant regulatory references to safely conduct Day Visual Flight Rules private flight operations for the issue of a Recreational Pilot Licence.
- CLO2 : Define and explain basic aerodynamic concepts and describe how these apply to single engine aeroplanes in flight.
- CLO3 : Explain the components, method of operation and applicable cockpit indications in relation to single engine aeroplane systems
- CLO4 : Define and explain basic meteorological concepts and describe their effect on flight.
- CLO5 : Calculate take-off and landing performance and determine weight and balance solutions using typical performance and loading systems.
- CLO6 : Define and explain basic human factors problems that affect day VFR flying.
- CLO7 : Define and apply visual navigation concepts to day flying and calculate solutions to navigation problems after interpreting navigation data.
- CLO8 : Satisfy the theoretical knowledge requirements of the CASR 1998 Part 61 MOS for the BAKC, RBKA, RFRC, RMTC, PNVC and PHFC units of competency.

Detailed Assessment Description

[Recreational pilot licence \(aeroplane\) exam - RPLA | Civil Aviation Safety Authority \(casa.gov.au\)](https://www.casa.gov.au/recreational-pilot-licence-aeroplane-exam-rpla)

Assessment Length

120 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.

Assessment information

Students may not change the date of their examination booking without Head of Operations approval.

Students who do not hand in the KDR imdeiatly following the examination and subsequently lose the original copy will be liable to purchase a replacement from CASA at their own expense.

Assignment submission Turnitin type

This is not a Turnitin assignment

Hurdle rules

If a student does not pass assessment task 5 (CASA RPLA) at the first attempt, then the result for AVIA1111 will be capped at 50% regardless of performance in the other assessment tasks, provided the student subsequently passes assessment task 5 within the time allowed.

All assessemnets must be completed by the end of term 3 exam period, 2024.

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

Your final mark for AVIA1111 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 1111

Grading Basis

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Navigation Computer	Lecture	<ul style="list-style-type: none"> • Density Altitude • Fuel Consumption • MACH and TAS • Multiplication and Division • OAT from IOAT • TAS from IOAT • TAS from OAT • TE and WCA • Time Speed Distance • True Altitude • HDG GS ETAS • HW XW • In Flight Wind • SINE COSINE TANGENT
Aerodynamics	Lecture	<ul style="list-style-type: none"> • 01 Mechanics • 03 NACA 20312 • 04 Aerodynamic Curves • 05 Subsonic Aerofoils • 06 Subsonic Drag • How an Aeroplane Flies - Weight and Lift • How an Aeroplane Flies - Thrust and Drag • 07 Winglet • 08 High Lift Devices • 09 Control Surfaces • 11 Centre of Gravity • 12 Vn Diagram & Load Factor • 13 Propeller Aerodynamics and Thrust • The Propeller Explained • 14 Level Flight • 15 Endurance • 16 Range • AGK 12 Supercharging • 18 Ground Effect • 19 Taxi • 20 Take-off • 21 Climb • 22 Turn • 23 Descent • 24 Landing • 25 Wind Shear • 26 Wind Shear Instrument Indications • 27 Stability 1 Static Stability and Dynamic Stability • 28 Stability 2 Pitching Moments • 29 Stability 3 Longitudinal, Lateral & Directional Stability • 30 Stability 4 Spiral Instability and Dutch Roll • 31 Stability 5 Short & Long Period Oscillation • 32 Spiral Dive • 33 Stall and Spin • 34 Wake Turbulence
Aircraft General Knowledge	Lecture	<ul style="list-style-type: none"> • 00 Parts of an Airplane Video • 00.1 Landing Gear Video • 01 Engine Components Video • 01 Engine Components • 02 Volumetric Efficiency • 03 Compression Ratio • 04 Horsepower • 05 Otto Cycle • 06 Oil System • 06 Oil System Video • 07 Exhaust and Cooling • 08 Ignition System • 09 Fuel and Engine Control • 10 Constant Speed Unit • 11 Fuel Systems • 11 Fuel Systems Video • 12 Supercharging • 13 Engine Icing • 14.1 Voltage and Amperes 1 • 14.2 Voltage and Amperes 2 • 14.3 Electrical System Video • 14.3 Electrical System • 15 Hydraulic System

		<ul style="list-style-type: none"> • 15 Hydraulic System Video • 16 Undecarriage • 17 Stall Warning Devices • 18 Fire Detection • 19 Auto Pilot • 20 Flight Controls Video • 21 Enviromental Systems Video
Meteorology	Lecture	<ul style="list-style-type: none"> • Meteorology • Meteorology Theoretical • 01 Definitions • 01.1 Airservices Definitions • 02 Standard Atmosphere • 03 Pressure & Density • 04 Insolation & Heat Transfer • 05 Latent Heat & Sensible Heat • Particulate Nature of Matter and Changes of State • 06 Temperature • 07 Humidity TDP MR SMR • 08 Stability • 09 Lifting Air • 10 Inversions • 11 Cloud Formation • 12 Precipitation • 13 Cloud Types • 14 Cumulonimbus • 14.1 Weather Hazards Video 54 mins • 15 Fog • 16 Airframe Icing • 17 Turbulence • 18 Local Circulation • 19 Air Mass Source Regions • 20 Frontal Weather • 21 Coriolis Apparent Force • 22 Global Circulation • Meteorology Operational • 1 Synoptic Charts • 2 Tropical Cyclone • 3 Graphical Area Forecast • 4 Operational Meteorology • 5 Skew T Log P • 6 BOM Products • 07 CASA Weather and forecasting part 1 - operational overview • 08 CASA Weather and forecasting part 2 - weather interpretation
Air Law	Lecture	<ul style="list-style-type: none"> • 01 Part 91 General Operating and Flight Rules • 91 MOS • 05 Part 61 Flight Crew Licensing • 01 Part 61 Preamble • 02 Part 61 RPL • 06 CAO 48.1 Fatigue • 1 CAO 48.1 Acronyms & Definitions • 2 CAO 48.1 Acclimatisation • 3 CAO 48.1 Private Operations • 4 CAO 48.1 Multiple Appendices • 5 CAO 48.1 Split Duty • 6 CAO 48.1 Appendix 1 Simple Operations • 02 Topic Presentations • 01 Aircraft Category • 02 Aircraft Lighting • 03 Airspace Services and Terms • 07 Alternate Planning Weather • 08 Altimeter Setting Procedures • 10 Comms NAVAID Failure • 11 Emergency Locator Transmitter • 13 Instruments for Flight • 15 Maintenance Release • 20 Visual Approach • 21 Passenger Carrying
Performance	Lecture	TBA by Lecture Mr Martin Jamieson.
Human Factors	Lecture	TBA by Lecture Mr Martin Jamieson.
Navigation	Lecture	<ul style="list-style-type: none"> • Radio Wave Theory & Propogation • 01 Transceiver • 02 Radio Waves • 03 Wavelength Calculation • 04 Phase Comparison • 05 Rated Coverage • 06 Propagation Characteristics • 07 Propagation Paths

		<ul style="list-style-type: none"> • 08 Modulation • 09 Ionosphere • 12 Communication • 13 Antenna • 14 Radar Principles • 15 Primary Radar • 16 Secondary Radar • 19 ADSB • Navigation Procedures • 01 1-60 Exercises • 02 Climbing & Descending Exercises • 03 Navigation Calculations
Navigation Computer	Lecture	<ul style="list-style-type: none"> • Density Altitude • Fuel Consumption • MACH and TAS • Multiplication and Division • OAT from IOAT • TAS from IOAT • TAS from OAT • TE and WCA • Time Speed Distance • True Altitude • HDG GS ETAS • HW XW • In Flight Wind • SINE COSINE TANGENT

Attendance Requirements

Please note that lecture recordings are not available for this course. Students are strongly encouraged to attend all classes and contact the Course Authority to make alternative arrangements for classes missed.

General Schedule Information

Course will run for 10 weeks and be held on Tuesday and Wednesday of each week, from 0830 to 1530 each day.

Course Resources

Prescribed Resources

To facilitate the distribution of textbooks, reference material and equipment, each student will receive a package containing the necessary materials.

Students will need to enrol into MOODLE using the following credentials: [Basic Aeronautical Knowledge - also known as the RPL\(a\) for CASA exams](#)

Link: <https://moodle.telt.unsw.edu.au/course/view.php?id=44860>, opens in a new window

Student key: FOUAK_RPL_BAK_STD

Recommended Resources

1. Aviation Theory Centre Basic Aeronautical Knowledge for the RPL, 4th Edition. 2018. David Robson.
2. Access to a comprehensive series of BAK lecture notes will be available on Moodle.
3. Navigation computer.
4. Scale ruler.
5. Protractor.
6. Legislative publications including CAR, CASR, CAO, AIP,
7. VTC, WAC ERC 1 & 2, ERC 3 & 7.

All the above texts will be issued directly to students by UNSW

Additional Costs

Only one attempt at assessment 5 is included in the course fee, any subsequent attempt is at the student's individual expense and payable directly to the service provider.

Course Evaluation and Development

To maintain a high degree of success the course is continually updated based upon changes to aviation regulations and student feedback of the final CASA external examination to ensure the course reflects current questioning trends.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Barry Ellis		Flying Operations Unit	02 9791 3047	By appointment	Yes	Yes
Lecturer	Martin Jamie son		Flying Operations Unit	02 9791 3047	By appointment	No	No
Head lecturer	Jeremy And rews		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 Plagiarism

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)