



AVAT13010 Aerodynamics and Aircraft General Knowledge (Air Transport Pilot Licence)

Term 1 - 2023

Profile information current as at 05/10/2023 09:04 am

All details in this unit profile for AVAT13010 have been officially approved by CQUniversity and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

General Information

Overview

Aerodynamics and Aircraft General Knowledge (Air Transport Pilot Licence) will provide you with advanced knowledge of transonic and supersonic aerodynamics, and heavy aircraft power plants and systems. You will cover the aeronautical knowledge requirements of the Civil Aviation Safety Authority Air Transport Pilot Licence (ATPL) aircraft general knowledge syllabus. You will study high speed aerodynamics and aircraft electrical and mechanical systems. Ice and rain protection systems will be examined. You will also study navigation and automatic control systems.

Details

Career Level: *Undergraduate*

Unit Level: *Level 3*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

Prerequisites: AVAT12006 Aerodynamics (Commercial Pilot Licence) and AVAT12007 General Aeronautical Knowledge (Commercial Pilot Licence).

Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the [Assessment Policy and Procedure \(Higher Education Coursework\)](#).

Offerings For Term 1 - 2023

- Brisbane
- Bundaberg
- Cairns
- Online

Attendance Requirements

All on-campus students are expected to attend scheduled classes - in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

Website

[This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.](#)

Class and Assessment Overview

Recommended Student Time Commitment

Each 6-credit Undergraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

Class Timetable

[Regional Campuses](#)

Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

[Metropolitan Campuses](#)

Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

1. **Written Assessment**

Weighting: 40%

2. **Examination**

Weighting: 60%

Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the [University's Grades and Results Policy](#) for more details of interim results and final grades.

CQUniversity Policies

All University policies are available on the [CQUniversity Policy site](#).

You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the [CQUniversity Policy site](#).

Unit Learning Outcomes

On successful completion of this unit, you will be able to:

1. Analyse the aerodynamic forces and performance in normal, asymmetric and high speed flight
2. Apply the principles of aerodynamics to high-speed flight
3. Evaluate large transport aircraft electrical and mechanical systems
4. Compare the operation and construction of turbo-fan and turbo-prop power plants
5. Examine the function of engine instruments
6. Explain the function and purpose of a large transport aircraft's automatic flight control system
7. Describe the principles of operation of a Global Navigation Satellite System.

N/A

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes						
	1	2	3	4	5	6	7
1 - Communication	•	•	•	•	•	•	•
2 - Problem Solving	•	•				•	
3 - Critical Thinking	•	•	•		•	•	
4 - Information Literacy	•	•	•	•			
5 - Team Work							
6 - Information Technology Competence							
7 - Cross Cultural Competence							•
8 - Ethical practice			•				
9 - Social Innovation							
10 - Aboriginal and Torres Strait Islander Cultures							

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
1 - Written Assessment - 40%	•	•	•	•		•	•	•		
2 - Examination - 60%	•	•	•				•	•		

Textbooks and Resources

Textbooks

AVAT13010

Prescribed

Aerodynamics, Engines & Airframe Systems for the Air Transport Pilot

3rd edition (2019)

Authors: Robson, D

Aviation Theory Centre

Brisbane , QLD , Australia

ISBN: 9781875537273

Binding: Paperback

AVAT13010

Prescribed

Avionics and Flight Management Systems for the Air Transport Pilot

Edition: 1st edn (2009)

Authors: Robson, D

Aviation Theory Centre

Brisbane , QLD , Australia

ISBN: 978-1-875-53743-3

Binding: Paperback

Additional Textbook Information

Paper versions can be purchased at the CQUni Bookshop here: <http://bookshop.cqu.edu.au> (search on the Unit code)

[View textbooks at the CQUniversity Bookshop](#)

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Recommended text books: 1. ATC Aerodynamics, Engines and Airframe Systems for the Air Transport Pilot. 2. ATC Avionics and Flight Management Systems for the Air Transport Pilot.

Referencing Style

All submissions for this unit must use the referencing style: [Harvard \(author-date\)](#)

For further information, see the Assessment Tasks.

Teaching Contacts

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Schedule

Week 1 - 06 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
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**Atmosphere
Terminology
Aerodynamic forces
Shockwaves**

ATC Advanced Aerodynamics, Engines
and Airframe systems

ATC Avionics and Flight Management
Systems

Week 2 - 13 Mar 2023

Module/Topic

Chapter

Events and Submissions/Topic

**Coffin corner
Performance and
speed
Performance and
altitude
Airframe and systems
Landing gear
Brakes
Steering**

ATC Advanced Aerodynamics,
Engines and Airframe systems

ATC Avionics and Flight
Management Systems

Week 3 - 20 Mar 2023

Module/Topic

Chapter

Events and Submissions/Topic

**Actuating systems
Hydraulic systems
Airconditioning
Pressurisation**

ATC Advanced Aerodynamics, Engines
and Airframe systems

ATC Avionics and Flight Management
Systems

Week 4 - 27 Mar 2023

Module/Topic

Chapter

Events and Submissions/Topic

**Ice and rain
protection
Carriage of fuel
Power plants
Turbine engines**

ATC Advanced Aerodynamics, Engines
and Airframe systems

ATC Avionics and Flight Management
Systems

Week 5 - 03 Apr 2023

Module/Topic

Chapter

Events and Submissions/Topic

Engine Construction
Turbines
Exhausts
Turbo-props

ATC Advanced Aerodynamics, Engines
and Airframe systems

ATC Avionics and Flight Management
Systems

Vacation Week - 10 Apr 2023

Module/Topic

Chapter

Events and Submissions/Topic

Vacation Week Self Study

Week 6 - 17 Apr 2023

Module/Topic

Chapter

Events and Submissions/Topic

Auxillary Power Units
Reverse thrust
Engine starting
Displays
Fuel consumption
EFIS

ATC Advanced Aerodynamics, Engines
and Airframe systems

ATC Avionics and Flight Management
Systems

Week 7 - 24 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
Automatic flight Control Systems (AFCS)		
Inertial Reference Systems (IRS) and Inertial Navigation System (INS)	ATC Advanced Aerodynamics, Engines and Airframe systems	
Flight Management Systems (FMS)	ATC Avionics and Flight Management Systems	
Flight Director		
Auto-pilot		

Week 8 - 01 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
Auto-flight		
Overspeed warning systems		
Ground Proximity Warning Systems (GPWS)		
Airborne Collision Avoidance Systems (ACAS)	ATC Advanced Aerodynamics, Engines and Airframe systems	
Traffic Collision Avoidance Systems (TCAS)	ATC Avionics and Flight Management Systems	
Digital Flight Data Recorder (DFDR)		
Health Usage Monitoring Systems (HUMS)		
Master warning systems		

Week 9 - 08 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
Fire detection and warning systems	ATC Advanced Aerodynamics, Engines and Airframe systems	
Extinguishing systems		
Global; Navigation Satellite Systems (GNSS)	ATC Avionics and Flight Management Systems	
Electrical systems		

Week 10 - 15 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
Battery and standby systems	ATC Advanced Aerodynamics, Engines and Airframe systems	
Fault protection Unit (FPU)		
Emergency Power supplies	ATC Avionics and Flight Management Systems	

Week 11 - 22 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
	ATC Advanced Aerodynamics, Engines and Airframe systems	
Revision weeks 1-5	ATC Avionics and Flight Management Systems	

Week 12 - 29 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
	ATC Advanced Aerodynamics, Engines and Airframe systems	
Revision weeks 6-10	ATC Avionics and Flight Management Systems	

Review/Exam Week - 05 Jun 2023

Module/Topic	Chapter	Events and Submissions/Topic
	ATC Advanced Aerodynamics, Engines and Airframe systems	
	ATC Avionics and Flight Management Systems	

Exam Week - 12 Jun 2023

Module/Topic	Chapter	Events and Submissions/Topic
Final Exam		

Assessment Tasks

1 Mid-term quiz

Assessment Type

Written Assessment

Task Description

The mid-term quiz will cover weeks 1-5 and there will be between 15-20 questions where the marks will range from 1 mark being a simple response single answer through to 3 Marks comprising of a short answer response giving a total of 40 marks

Mid-term quiz date TBA

Assessment Due Date**Return Date to Students****Weighting**

40%

Assessment Criteria

The quiz will contain both Single and short answer response type questions. The assessment will show an understanding of the concepts of topics covered in weeks 1 to 5.

Referencing Style

- [Harvard \(author-date\)](#)

Submission

Online

Learning Outcomes Assessed

- Analyse the aerodynamic forces and performance in normal, asymmetric and high speed flight
- Apply the principles of aerodynamics to high-speed flight
- Evaluate large transport aircraft electrical and mechanical systems
- Compare the operation and construction of turbo-fan and turbo-prop power plants

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence
- Cross Cultural Competence
- Ethical practice

Examination

Outline

Complete an invigilated examination.

Date

During the examination period at a CQUniversity examination centre.

Weighting

60%

Length

120 minutes

Minimum mark or grade

50%

Exam Conditions

Closed Book.

Materials

Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments).

Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the [Student Academic Integrity Policy and Procedure](#). This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

What is a breach of academic integrity?

A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

Why is academic integrity important?

A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

Where can I get assistance?

For academic advice and guidance, the [Academic Learning Centre \(ALC\)](#) can support you in becoming confident in completing assessments with integrity and of high standard.

What can you do to act with integrity?



Be Honest

If your assessment task is done by someone else, it would be dishonest of you to claim it as your own



Seek Help

If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)



Produce Original Work

Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem