



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

## Term 1 - 2024

Profile information current as at 25/04/2025 09:25 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 - 2024

- 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](#).

## Previous Student Feedback

### Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

#### Feedback from UC reflections

**Feedback**

Better prepare students for the exams

**Recommendation**

Restructuring of the unit should continue to give students a better understanding of the topic as well as a change in the final exams. Further work should incorporate interactive components to assist with the understanding of this subject material required to pass the CQU and CASA exams.

## 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

[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

**Doug Drury** Unit Coordinator

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## Schedule

### Week 1 - 04 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
<b>Atmosphere Terminology</b>	<b>ATC Advanced Aerodynamics, Engines and Airframe systems</b>	
<b>Aerodynamic forces</b>	<b>ATC Avionics and Flight Management Systems</b>	
<b>Shockwaves</b>		

**Week 2 - 11 Mar 2024**

Module/Topic	Chapter	Events and Submissions/Topic
<b>Coffin corner</b>		
<b>Performance and speed</b>		
<b>Performance and altitude</b>	ATC Advanced Aerodynamics, Engines and Airframe systems	
<b>Airframe and systems</b>	ATC Avionics and Flight Management Systems	
<b>Landing gear</b>		
<b>Brakes</b>		
<b>Steering</b>		

**Week 3 - 18 Mar 2024**

Module/Topic	Chapter	Events and Submissions/Topic
<b>Actuating systems</b>		
<b>Hydraulic systems</b>	ATC Advanced Aerodynamics, Engines and Airframe systems	
<b>Airconditioning</b>		
<b>Pressurisation</b>	ATC Avionics and Flight Management Systems	

**Week 4 - 25 Mar 2024**

Module/Topic	Chapter	Events and Submissions/Topic
<b>Ice and rain protection</b>		
<b>Carriage of fuel</b>	ATC Advanced Aerodynamics, Engines and Airframe systems	
<b>Power plants</b>		
<b>Turbine engines</b>	ATC Avionics and Flight Management Systems	

**Week 5 - 01 Apr 2024**

Module/Topic	Chapter	Events and Submissions/Topic
<b>Engine Construction</b>		
<b>Turbines</b>	ATC Advanced Aerodynamics, Engines and Airframe systems	
<b>Exhausts</b>		
<b>Turbo-props</b>	ATC Avionics and Flight Management Systems	

**Vacation Week - 08 Apr 2024**

Module/Topic	Chapter	Events and Submissions/Topic
Vacation Week Self Study		

**Week 6 - 15 Apr 2024**

Module/Topic	Chapter	Events and Submissions/Topic
<b>Auxillary Power Units</b>		
<b>Reverse thrust</b>		
<b>Engine starting</b>	ATC Advanced Aerodynamics, Engines and Airframe systems	
<b>Displays</b>		
<b>Fuel consumption</b>		
<b>EFIS</b>	ATC Avionics and Flight Management Systems	

**Week 7 - 22 Apr 2024**

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

**Week 8 - 29 Apr 2024**

Module/Topic	Chapter	Events and Submissions/Topic
Auto-flight		
Overspeed warning systems		
Ground Proximity Warning Systems (GPWS)	ATC Advanced Aerodynamics, Engines and Airframe systems	
Airborne Collision Avoidance Systems (ACAS)		
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 - 06 May 2024**

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 - 13 May 2024**

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 - 20 May 2024**

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 - 27 May 2024**

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 - 03 Jun 2024

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

## Exam Week - 10 Jun 2024

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