



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

## Term 1 - 2021

Profile information current as at 08/05/2024 09:26 pm

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 - 2021

- 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](#).

## 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 Student Evaluation

**Feedback**

Learning resources were insufficient.

**Recommendation**

Continuity of instruction throughout the term is critical to learning outcomes.

#### Feedback from UC observation

**Feedback**

Student engagement was low.

**Recommendation**

Use recorded lectures and provide more interactive tutorials.

## 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

 N/A Level	 Introductory Level	 Intermediate Level	 Graduate Level	 Professional Level	 Advanced Level
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### 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**

Aviation Theory Centre

ISBN: 1-875537-80-5

Binding: Paperback

AVAT13010

#### Prescribed

##### **Avionics and Flight Management Systems for the Air Transport Pilot**

Aviation Theory Centre

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

**Chris Bernecic** Unit Coordinator

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## Schedule

### Week 1 - 08 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Advanced Aerodynamics 1.	Aerodynamics, Engines and Airframe Systems, Avionics and Flight Management Systems.	

### Week 2 - 15 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Advanced Aerodynamics 2.	Aerodynamics, Engines and Airframe Systems, Avionics and Flight Management Systems.	

### Week 3 - 22 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Airframe and Systems 1.	Aerodynamics, Engines and Airframe Systems, Avionics and Flight Management Systems.	
<b>Week 4 - 29 Mar 2021</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Airframe and Systems 2.	Aerodynamics, Engines and Airframe Systems, Avionics and Flight Management Systems.	
<b>Week 5 - 05 Apr 2021</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Power Plants.	Aerodynamics, Engines and Airframe Systems, Avionics and Flight Management Systems.	
<b>Vacation Week - 12 Apr 2021</b>		
Module/Topic	Chapter	Events and Submissions/Topic
No lectures.		
<b>Week 6 - 19 Apr 2021</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Engine Instruments 1.	Aerodynamics, Engines and Airframe Systems, Avionics and Flight Management Systems.	
<b>Week 7 - 26 Apr 2021</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Engine Instruments 2.	Aerodynamics, Engines and Airframe Systems, Avionics and Flight Management Systems.	
<b>Week 8 - 03 May 2021</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Flight Instrument Systems 1.	Aerodynamics, Engines and Airframe Systems, Avionics and Flight Management Systems.	
<b>Week 9 - 10 May 2021</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Flight Instrument Systems 2.	Aerodynamics, Engines and Airframe Systems, Avionics and Flight Management Systems.	
<b>Week 10 - 17 May 2021</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Warning and recording equipment 1.	Aerodynamics, Engines and Airframe Systems, Avionics and Flight Management Systems.	<b>Written Assignment</b> Due: Week 10 Friday (21 May 2021) 11:59 pm AEST
<b>Week 11 - 24 May 2021</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Warning and recording equipment 2.	Aerodynamics, Engines and Airframe Systems, Avionics and Flight Management Systems.	
<b>Week 12 - 31 May 2021</b>		
Module/Topic	Chapter	Events and Submissions/Topic

Global Navigation Satellite Systems.  
Review.

Aerodynamics, Engines and  
Airframe Systems, Avionics and  
Flight Management Systems.

#### Review/Exam Week - 07 Jun 2021

Module/Topic	Chapter	Events and Submissions/Topic
Review / final exam.	Aerodynamics, Engines and Airframe Systems, Avionics and Flight Management Systems.	

#### Exam Week - 14 Jun 2021

Module/Topic	Chapter	Events and Submissions/Topic
Final exam.	Aerodynamics, Engines and Airframe Systems, Avionics and Flight Management Systems.	

## Assessment Tasks

### 1 Written Assignment

#### Assessment Type

Written Assessment

#### Task Description

##### Aim of the assignment

To broaden your understanding of knowledge presented in the unit.

##### Assignment Description

Select an aircraft accident pertaining to a **medium aircraft** (MTOW rating between 7 t and 136 t) or **heavy aircraft** (136 tonnes or more).

Ensure that the accident involves an element relating to aerodynamics. For example, loss of control due to stall or spin. As another example, the primary cause of an accident may be due to lack of training or pilot fatigue, which gave rise to a loss of situational awareness after which the aircraft entered a deep stall and crashed.

Critically analyse the accident. Include in your paper:

- Accident description (what, when, why, etc);
- The aerodynamics and systems factors contributing to this accident;
- The safety analysis and recommendations.

If there is limited information available about the accident, you may expression your own opinion but ensure you justify your reasoning.

##### Resources

Use on-line aircraft accident databases to find relevant accidents. For example:

<https://www.atsb.gov.au/>

<https://aviation-safety.net/database/>

[https://www.nts.gov/\\_layouts/ntsb.aviation/index.aspx](https://www.nts.gov/_layouts/ntsb.aviation/index.aspx)

<http://www.aviation-accidents.net/>

There are many other databases.

##### Format

The paper should be written in a report format with a title page, executive summary, introduction, main body, conclusion / recommendations.

Referencing required is Harvard style.

Include number the pages, word count and a table of contents.

Use Calibri (Body) 11 font.

##### Assessment

Refer to the Rubric marking matrix on Moodle.

##### Assessment Due Date

Week 10 Friday (21 May 2021) 11:59 pm AEST

##### Return Date to Students

Review/Exam Week Friday (11 June 2021)

##### Weighting

40%

## **Assessment Criteria**

### **High distinction standard**

- \* the answer is very well written and clearly expressed
- \* there is a demonstrated appreciation and understanding of the issues involved
- \* the answer is well structured and logically organised
- \* demonstrated mastery of referencing system
- \* there is evidence of a comprehensive analysis of the issues
- \* conclusions are backed by well-reasoned arguments demonstrating a detailed insight and analysis of issues
- \* comprehensive coverage of all relevant issues

### **Distinction standard**

- \* the answer is well written and expressed
- \* the answer is structured and logical
- \* the issues have been reasonably well identified and appreciated
- \* there is correct use of referencing
- \* issues have been analysed
- \*\* there is a comprehensive coverage of the issues

### **Credit standard**

- \* the answer is generally well written and expressed
- \* the answer is structured and sequential
- \* referencing is satisfactory
- \* issues are identified and addressed
- \* there has been an attempt to analyse some of the issues
- \* the coverage of issues is reasonably comprehensive often with a good treatment and analysis of particular points
- \* depth of treatment is often lacking in some of the issues.

### **Pass standard**

- \* the answer is able to be followed and understood
- \* the answer could perhaps be better organised and structured
- \* the referencing may need improvement
- \* issues may need to be identified and addressed in more depth
- \* analysis when present may be incorrect
- \* sometimes the conclusions reached are simple
- \* there may be quantities of material of marginal relevance included in the answer.

### **Fail standard**

- \* the answer may be significantly short of the required length
- \* the written expression is poor and difficult to understand
- \* the answer is poorly organised
- \* there has been a failure to identify and address the issues in the question
- \* referencing is generally inadequate
- \* the reasoning and application demonstrated is poor
- \* frequently there is much irrelevant material.

## **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