



# AVAT12006 Aerodynamics (Commercial Pilot Licence)

## Term 1 - 2019

Profile information current as at 05/07/2022 04:42 pm

All details in this unit profile for AVAT12006 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 (Commercial Pilot Licence) will provide you with the knowledge of aerodynamics relevant for low altitude, sub-sonic flight in piston engine aircraft. You will cover the aeronautical knowledge requirements of the Civil Aviation Safety Authority Commercial Pilot Licence aerodynamics syllabus. You will study the aerodynamic properties of an aerofoil and how it produces lift and drag. You will also study the forces and moments acting on an aeroplane in flight and how these affect an aeroplane's stability and controllability. Normal and abnormal flight characteristics and performance will also be studied.

### Details

Career Level: *Undergraduate*

Unit Level: *Level 2*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

### Pre-requisites or Co-requisites

Prerequisites: AVAT11002 Basic Aeronautical Knowledge; AVAT11003 Basic Aeronautical Practice and AVAT11005 Aviation Physics

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 - 2019

- 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. **Group Work**

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 Survey

**Feedback**

Assessment tasks need more detail.

**Recommendation**

Details of the assessment task will be improved.

## Unit Learning Outcomes

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

1. Explain the aerodynamic properties of an aerofoil
2. Apply the Coanda effect and Bernoulli's theorem to demonstrate and calculate how an aerofoil produces lift and drag
3. Examine the forces and moments acting on an aircraft in all stages of flight
4. Discuss the factors that affect stability and control of an aircraft in flight
5. Determine the performance aspects of power, weight and speed in flight manoeuvres
6. Explain the factors that affect the stall and spin characteristics of an aeroplane.

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
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 - Group Work - 40%	•	•	•	•	•	•				
2 - Examination - 60%	•	•	•	•						

## Textbooks and Resources

### Textbooks

There are no required textbooks.

### IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Recommended text book: Aerodynamics for the Private and Commercial Pilot Licences.

## Referencing Style

All submissions for this unit must use the referencing style: [Harvard \(author-date\)](#)  
For further information, see the Assessment Tasks.

## Teaching Contacts

**Steven Thatcher** Unit Coordinator  
[s.thatcher@cqu.edu.au](mailto:s.thatcher@cqu.edu.au)

## Schedule

### Week 1 - 11 Mar 2019

Module/Topic	Chapter	Events and Submissions/Topic
Introduction, Atmosphere, ISA, Terminology 1.	Aerodynamics: Chapter 1.	

### Week 2 - 18 Mar 2019

Module/Topic	Chapter	Events and Submissions/Topic
Terminology 2, Bernoulli, Coanda, Newton laws, Airspeed.	Aerodynamics: Chapter 1.	

### Week 3 - 25 Mar 2019

Module/Topic	Chapter	Events and Submissions/Topic
Lift - 4 forces, CP, pressure distribution around aerofoils, $\alpha$ .	Aerodynamics: Chapter 1.	

### Week 4 - 01 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Drag.	Aerodynamics: Chapter 1.	

### Week 5 - 08 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Flight controls, aerodynamic balancing, straight and level, climb, pitching moments.	Aerodynamics: Chapters 3 and 5.	

### Vacation Week - 15 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
No lectures.		

### Week 6 - 22 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Descent, turns, stall.	Aerodynamics: Chapters 5, 6 and 8.	

### Week 7 - 29 Apr 2019

Module/Topic	Chapter	Events and Submissions/Topic
Spin, Spiral Dive, Taxi, Takeoff, Landing.	Aerodynamics: Chapters 7 and 8.	

### Week 8 - 06 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
Stability and Control 1.	Aerodynamics: Chapter 4.	

### Week 9 - 13 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Stability and Control 2.

Aerodynamics: Chapter 4.

**Assignment** Due: Week 9 Monday (13 May 2019) 9:00 am AEST

#### Week 10 - 20 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
Wake turbulence, Aircraft Limitations.	Aerodynamics: Chapter 7.	

#### Week 11 - 27 May 2019

Module/Topic	Chapter	Events and Submissions/Topic
Application of Aerodynamics.	Aerodynamics: Chapters 1 and 3 to 8.	

#### Week 12 - 03 Jun 2019

Module/Topic	Chapter	Events and Submissions/Topic
Review.	Aerodynamics: Chapters 1 and 3 to 8.	

#### Review / Exam - 10 Jun 2019

Module/Topic	Chapter	Events and Submissions/Topic
Review / final exam.	Aerodynamics: Chapters 1 and 3 to 8.	

#### Exam Week - 17 Jun 2019

Module/Topic	Chapter	Events and Submissions/Topic
Final exam.	Aerodynamics: Chapters 1 and 3 to 8.	

## Term Specific Information

Recommended text book:

**Aerodynamics for the Private and Commercial Pilot Licences.**

ISBN 978-1-875537-83-9

Aviation Theory Centre Pty Ltd

[www.aviationtheory.net.au](http://www.aviationtheory.net.au)

## Assessment Tasks

### 1 Assignment

#### Assessment Type

Group Work

#### Task Description

A written assignment worth 40% will be issued in week 2. The due date will be week 9.

Note that this is NOT Group Work; the assignment must be completed individually.

The assignment will require students to identify, research and discuss various concepts covered in this unit. More details will be provided in week 2.

The assignment should be submitted in Turnitin in Moodle by the due date.

The assignment should be submitted as either a Word or a PDF document.

Note: all submissions are processed through the plagiarism software (Turnitin) and, in line with university policy, the work should be unique.

#### Assessment Due Date

Week 9 Monday (13 May 2019) 9:00 am AEST

#### Return Date to Students

Exam Week Monday (17 June 2019)

#### 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

- Explain the aerodynamic properties of an aerofoil
- Apply the Coanda effect and Bernoulli's theorem to demonstrate and calculate how an aerofoil produces lift and drag
- Examine the forces and moments acting on an aircraft in all stages of flight
- Discuss the factors that affect stability and control of an aircraft in flight
- Determine the performance aspects of power, weight and speed in flight manoeuvres

## Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Team Work

- Information Technology Competence

## Examination

**Outline**

Complete an invigilated examination.

**Date**

During the examination period at a CQUniversity examination centre.

**Weighting**

60%

**Length**

90 minutes

**Exam Conditions**

Closed Book.

**Materials**

Calculator - non-programmable, no text retrieval, silent only

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