



AVAT12006 Aerodynamics (Commercial Pilot Licence)

Term 1 - 2018

Profile information current as at 05/07/2022 04:17 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 - 2018

- Bundaberg
- Cairns
- Distance

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](#).

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

AVAT12006

Prescribed

Aerodynamics For The CASA PPL/CPL Day VFR Syllabus

Edition: Most recent available (Current Edition)

Authors: Aviation Theory Centre

Aviation Theory Centre

Cheltenham , Victoria , Australia

ISBN: 9781875537839

Binding: Other

Additional Textbook Information

The textbook can be purchased through the bookstore. You may also purchase it from Aviation Theory Centre:

<https://aviationtheory.net.au/> You can view a picture of the book here:

https://www.conceptaviation.com.au/image/ex-large/2708_aerodynamics-aviation-theory-centre.jpg

[View textbooks at the CQUniversity Bookshop](#)

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)

Referencing Style

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

For further information, see the Assessment Tasks.

Teaching Contacts

Sabitha Banu Unit Coordinator

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Schedule

Week 1 - 05 Mar 2018

Module/Topic	Chapter	Events and Submissions/Topic
Forces Acting on the Aeroplane	Forces Acting on the Aeroplane	

Week 2 - 12 Mar 2018

Module/Topic	Chapter	Events and Submissions/Topic
Propellers	Propellers	

Week 3 - 19 Mar 2018

Module/Topic	Chapter	Events and Submissions/Topic
Balance and Trim	Balance and Trim	

Week 4 - 26 Mar 2018

Module/Topic	Chapter	Events and Submissions/Topic
Stability and Control 1	Stability and Control 1	

Week 5 - 02 Apr 2018

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

Vacation Week - 09 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic
Enjoy the time off although remember you have an assignment due soon and an upcoming exam. Be great, Ron Bishop		

Week 6 - 16 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic
Straight Flight	Straight Flight	

Week 7 - 23 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic
Climbing and Descending	Straight Flight (Flight Profiles)	

Week 8 - 30 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic
Turning	Turning	

Week 9 - 07 May 2018

Module/Topic	Chapter	Events and Submissions/Topic
Atmospheric Disturbances	Effects of Atmospheric Disturbances	AVGAS Solution Paper Due: Week 9 Monday (7 May 2018) 9:00 am AEST

Week 10 - 14 May 2018

Module/Topic	Chapter	Events and Submissions/Topic
Windshear and Turbulence	Effects of Atmospheric Disturbances	

Week 11 - 21 May 2018

Module/Topic	Chapter	Events and Submissions/Topic
Stalling	Stalling	

Week 12 - 28 May 2018

Module/Topic	Chapter	Events and Submissions/Topic
Spin and Stall Recovery	Stalling	

Review/Exam Week - 04 Jun 2018

Module/Topic	Chapter	Events and Submissions/Topic

Exam Week - 11 Jun 2018

Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 AVGAS Solution Paper

Assessment Type

Group Work

Task Description

This assignment will broaden your understanding of alternative fuel or propulsion systems. You will need to scan relevant literature (textbooks, websites, etc) to explain and discuss alternative fuel or propulsion systems for General Aviation. The main fuel source currently used in General Aviation is AVGAS. Experts agree that AVGAS availability is declining. Parts of the world don't have access to AVGAS. This is a concern to aviation as a large portion of General Aviation (GA) relies on AVGAS to operate. Electric power,

Diesel/Kerosene (AVTUR), and many other fuels and propulsion systems are being explored.

Your paper should briefly cover the following areas:

Replacing AVGAS with alternative fuel or propulsion systems in General Aviation.

The paper will draw on sourced literature and other sources. (Hint: Use the Library's resource search and online journal databases, (eg., Ebscohost, books, videos, etc.)

Format

The paper is to be written in essay format, with an Introduction, Body, and Conclusion, and will be properly referenced using the Harvard Style. An abstract is required. Do not provide a table of contents. Pages should be numbered in Arabic numerals at the top right corner, except for the title page (no page number) and the abstract should have Roman numerals starting at ii. 1500 words maximum.

Assessment Due Date

Week 9 Monday (7 May 2018) 9:00 am AEST

Return Date to Students

Weighting

40%

Assessment Criteria

Written Assessment

Assessment Criteria

Demonstrates knowledge and understanding of the AVGAS problem and development of new fuels and propulsion systems to solve this problem. Extensive knowledge and understanding of the historical development of aviation as demonstrated by a well informed and critical discussion of the conditions and technological advances that will solve the AVGAS problem in General Aviation.

HD: Excellent and appropriate use of examples and good grasp of how technology can change GA from using primarily AVGAS to Alternative Fuels or propulsion systems to ensure the fuel source is sustainable.

D: Considerable knowledge and understanding of the fuel issues of aviation as demonstrated by a well informed and critical discussion of the conditions and technological advances which will lead to a sustainable fuel. Very good use of examples.

C: Appropriate use of examples of possible fuels and propulsion systems that can ensure General Aviation is Sustainable. Decent use of examples.

P: Basic knowledge and understanding of the alternative fuel development of aviation as demonstrated by a well informed and critical discussion of the conditions and technological advances that will lead to a sustainable fuel source.

P: Some use of examples and milestones. Little knowledge and understanding of the AVGAS problem of General Aviation as demonstrated by a well informed and critical discussion of the conditions and technological advances which lead to the development of a sustainable fuel for General Aviation.

F: No use of examples. No grasp of the subject on the AVGAS problem. No or limited references. Very poor referencing.

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

Open 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