



# AVAT13008 Navigation (Air Transport Pilot Licence)

## Term 1 - 2022

Profile information current as at 03/05/2024 06:19 am

All details in this unit profile for AVAT13008 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

Navigation (Air Transport Pilot Licence) will provide you with advanced knowledge of national and international navigation procedures applicable to heavy aircraft operations. You will cover the aeronautical knowledge requirements of the Civil Aviation Safety Authority Air Transport Pilot Licence (ATPL) navigation syllabus. You will learn how to interpret chart projections. You will convert between international time zones and study radio navigation aids. Altimetry procedures required for international and national flights will be examined. You will calculate critical points and convert between airspeed types.

### 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: AVAT12009 Navigation (Commercial Pilot Licence) and AVAT12008 Meteorology (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 - 2022

- 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. **Online Test**

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 SUTE

##### Feedback

Optional Moodle quizzes may be included before the exams to help students reinforce some of the concepts explored throughout the term.

##### Recommendation

Additional quizzes will be made available.

#### Feedback from SUTE

##### Feedback

Learning resources were sufficient, relevant covering all topics.

##### Recommendation

Agree and further improvements will be made.

## Unit Learning Outcomes

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

1. Demonstrate competencies on the Advanced Navigation components of ATPL (Airline Transport Pilot License); as detailed in Schedule 3 of Part 61, MOS (Manual of Standards) of CASR (Civil Aviation Safety Regulations)
2. Interpret the various global navigation chart projections and explain their use on national and international flights
3. Convert between global time zones, Universal Coordinated Time and local time
4. Evaluate the operation and limitations of radio navigation aids
5. Examine the altimetry procedures used on national and international flights
6. Convert between various airspeed types
7. Calculate on-track and off-track critical points for various abnormal operations.

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 - Online Test - 40% | •                 | • | • |   | • | • |   |
| 2 - Examination - 60% | •                 | • | • | • | • | • | • |

### Alignment of Graduate Attributes to Learning Outcomes

| Graduate Attributes                                 | 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 - Online Test - 40% | •                   | • | • | • |   | • | • | • |   |    |
| 2 - Examination - 60% | •                   | • | • |   |   |   | • | • |   |    |

## Textbooks and Resources

### Textbooks

AVAT13008

#### Supplementary

#### ATPL Navigation Part 1 and Part 2

Edition: Product Code Av 2 and Av 9

Authors: Rob Avery

Avfacts Pilot Theory Specialists

Sorell , Tasmania , Australia

Binding: Spiral

### 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

**Aruna Ranganathan** Unit Coordinator  
[a.ranganathan@cqu.edu.au](mailto:a.ranganathan@cqu.edu.au)

## Schedule

### Introduction and Pressure Instruments - 07 Mar 2022

| Module/Topic                 | Chapter | Events and Submissions/Topic |
|------------------------------|---------|------------------------------|
| Introduction to unit         |         |                              |
| Typical pitot static systems |         |                              |
| Altimeter                    |         |                              |
| Airspeed indicator           |         |                              |
| Machmeter                    |         |                              |
| Vertical speed indicator     |         |                              |

### Gyroscopes and Compasses - 14 Mar 2022

| Module/Topic  | Chapter | Events and Submissions/Topic |
|---|---------|------------------------------|
| Principles of gyroscopes: rigidity and precession, drift and topple     |         |                              |
| Types of gyroscopes: air and electrically driven, ring laser gyroscopes |         |                              |
| Compasses   |         |                              |
| Directional gyroscope   |         |                              |
| Attitude indicator  |         |                              |
| Turn and slip indicator   |         |                              |
| Remote magnetic indicator and flux valves                               |         |                              |

### Charts - 21 Mar 2022

| Module/Topic                             | Chapter | Events and Submissions/Topic |
|--|---------|------------------------------|
| Fundamental principles, terms and models |         |                              |
| Departure                                |         |                              |
| Convergence                              |         |                              |
| Ideal characteristics                    |         |                              |
| Common projections overview              |         |                              |
| Mercator projections                     |         |                              |

### Charts and Time - 28 Mar 2022

| Module/Topic                   | Chapter | Events and Submissions/Topic |
|--------------------------------|---------|------------------------------|
| Charts (continued)             |         |                              |
| Polar stereographic projection |         |                              |
| Lamberts conformal projection  |         |                              |
| Standard time formats          |         |                              |
| Time zones                     |         |                              |
| Local mean time                |         |                              |

### Radio Wave Propagation - 04 Apr 2022

| Module/Topic | Chapter | Events and Submissions/Topic |
|--------------|---------|------------------------------|
|--------------|---------|------------------------------|

General principles  
Types of wave propagation  
Antennae types and functions

Online quiz: 40%

#### **Vacation Week - 11 Apr 2022**

| Module/Topic | Chapter | Events and Submissions/Topic |
|--------------|---------|------------------------------|
|--------------|---------|------------------------------|

#### **ETP, PNR and PSD - 18 Apr 2022**

| Module/Topic | Chapter | Events and Submissions/Topic |
|--------------|---------|------------------------------|
|--------------|---------|------------------------------|

Calculating ETP  
Calculating PNR  
Calculating off-track PSD

**Mid Term Test** Due: Week 6 Tuesday  
(19 Apr 2022) 11:45 pm AEST

#### **Conventional Radio Aids - 25 Apr 2022**

| Module/Topic | Chapter | Events and Submissions/Topic |
|--------------|---------|------------------------------|
|--------------|---------|------------------------------|

NDB and ADF  
VOR  
DME  
ILS  
MLS

#### **RADAR - 02 May 2022**

| Module/Topic | Chapter | Events and Submissions/Topic |
|--------------|---------|------------------------------|
|--------------|---------|------------------------------|

Primary RADAR  
Secondary RADAR  
Radio altimeter  
Weather RADAR

#### **Inertial Navigation - 09 May 2022**

| Module/Topic | Chapter | Events and Submissions/Topic |
|--------------|---------|------------------------------|
|--------------|---------|------------------------------|

Principles of operation and use  
Gyrostabilized and strap down systems  
Alignment  
Accuracy and errors

#### **Satellite Navigation - 16 May 2022**

| Module/Topic | Chapter | Events and Submissions/Topic |
|--------------|---------|------------------------------|
|--------------|---------|------------------------------|

Principles of operation and use  
Accuracy and errors  
RAIM and FDE

#### **RNAV and Integrated Systems - 23 May 2022**

| Module/Topic | Chapter | Events and Submissions/Topic |
|--------------|---------|------------------------------|
|--------------|---------|------------------------------|

Typical modern systems and principles  
Air data computers  
Position updating  
EFIS displays and presentation  
Route considerations

#### **Modern Navigation - 30 May 2022**

| Module/Topic | Chapter | Events and Submissions/Topic |
|--------------|---------|------------------------------|
|--------------|---------|------------------------------|

GNSS enhancements  
Performance based navigation  
ADS-B, ADS-C  
LIDAR

#### **Review/Exam Week - 06 Jun 2022**

| Module/Topic | Chapter | Events and Submissions/Topic |
|--------------|---------|------------------------------|
|--------------|---------|------------------------------|

## Assessment Tasks

### 1 Mid Term Test

**Assessment Type**

Online Test

**Task Description**

This quiz will cover all material in weeks 1 to 5.

This will be an online test, consisting of multiple choice and short answer questions.

**Assessment Due Date**

Week 6 Tuesday (19 Apr 2022) 11:45 pm AEST

**Return Date to Students**

Week 7 Monday (25 Apr 2022)

**Weighting**

40%

**Assessment Criteria**

Students should be able to:

- explain the principle of operation of basic air data and gyroscopic flight instruments, and their associated errors
- interpret Mercator, Lambert's Conformal, and Polar Stereographic chart projections, and explain their differences and uses
- convert between different time zones
- resolve airspeed conversion and altimetry problems
- explain basic principles of radio wave propagation

**Referencing Style**

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

**Submission**

Online

**Learning Outcomes Assessed**

- Demonstrate competencies on the Advanced Navigation components of ATPL (Airline Transport Pilot License); as detailed in Schedule 3 of Part 61, MOS (Manual of Standards) of CASR (Civil Aviation Safety Regulations)
- Interpret the various global navigation chart projections and explain their use on national and international flights
- Convert between global time zones, Universal Coordinated Time and local time
- Examine the altimetry procedures used on national and international flights
- Convert between various airspeed types

**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**

Restricted.

**Materials**

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

Calculator - all non-communicable calculators, including scientific, programmable and graphics calculators are authorised

## 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