



ENTA13022 Remote Piloted Aircraft Systems

Term 1 - 2023

Profile information current as at 06/05/2024 11:45 am

All details in this unit profile for ENTA13022 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

The unit will provide you with the fundamental knowledge of Remote Piloted Aircraft Systems technology. You will explore current and future developments of Remote Piloted Aircraft Systems applications such as surveying, photography, inspections, agriculture, and mining with a focus on applying automation in these areas. You will cover important elements of Remote Piloted Aircraft Systems operations, including weight and balance on design and structure. You will also evaluate the impact of the various navigation systems on Remote Piloted Aircraft Systems applications and will have exposure to other aspects associated with operating a Remote Piloted Aircraft such as Human Factors, Air Legislation, and Meteorology. You will get the opportunity to select components, and assemble, operate and maintain a Remote Piloted Aircraft System to support a given scenario. At the end of this unit, you will be able to build and fly a Remote Piloted Aircraft. If you complete the optional residential school activity, you will be eligible to apply for Certificate III in Aviation (Remote Pilot) and the Australian Civil Aviation Safety Authority Remote Pilot License and Aeronautical Radio Operator Certificate.

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: Completion of 72cps.

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 - 2023

- Online
- Rockhampton

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).

Residential Schools

This unit has a Optional Residential School for distance mode students and the details are:

Click here to see your [Residential School Timetable](#).

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 Quiz(zes)**

Weighting: 30%

2. **Written Assessment**

Weighting: 20%

3. **Project (applied)**

Weighting: 30%

4. **Practical Assessment**

Weighting: 20%

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. Compare different types of Remote Piloted Aircraft Systems applications, associated structural devices, and their integration into a working unit
2. Demonstrate problem-solving skills by assembling components, and operating and maintaining a Remote Piloted Aircraft System
3. Reflect and report on the impact of the various navigation systems, human factors, and meteorology on Remote Piloted Aircraft operations
4. Build and fly a Remote Piloted Aircraft safely and competently
5. Provide evidence of a professional capacity to communicate, work and learn individually and in a team by completing a mini-project.

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
1 - Written Assessment - 20%	•	•	•		
2 - Practical Assessment - 20%				•	•
3 - Online Quiz(zes) - 30%	•		•		
4 - Project (applied) - 30%		•		•	•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes				
	1	2	3	4	5
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					

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)

Referencing Style

All submissions for this unit must use the referencing style: [American Psychological Association 7th Edition \(APA 7th edition\)](#)

For further information, see the Assessment Tasks.

Teaching Contacts

Mike Malouf Unit Coordinator
m.malouf@cqu.edu.au

Schedule

Week 1 - 06 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
Lecture 1 RPA Applications	Lessonbook 1	Quiz 1

Week 2 - 13 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
Lecture 2 Infotechnological devices	Lessonbook 2	Quiz 2 Written Assignment Due: Week 4 Wednesday (29 Mar 2023) 11:00 pm AEST

Week 3 - 20 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
Lecture 3 RPA Hardware	Lessonbook 3	Quiz 3

Week 4 - 27 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
Lecture 4 RPA Software, sensors, telemetry	Lessonbook 4	Quiz 4 Written Assignment Due: Week 4 Wednesday (29 Mar 2023) 11:00 pm AEST

Week 5 - 03 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
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Lecture 5
RPA Aeronautical knowledge-fixed wing

Lessonbook 5

Quiz 5

Vacation Week - 10 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
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Week 6 - 17 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
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Lecture 6
RPA Aeronautical Knowledge-rotary wing

Lessonbook 6

Quiz 6

Week 7 - 24 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
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Lecture 7
Automated vs autonomous flight management systems

Lessonbook 7

Quiz 7

Week 8 - 01 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
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Lecture 8
RPA Navigation

Lessonbook 8

Quiz 8

Week 9 - 08 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
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Lecture 9
Meteorology

Aviation Australia to provide lecture content

Week 10 - 15 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
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Lecture 10
Human Factors

Aviation Australia to provide lecture content

Week 11 - 22 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
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Lecture 11
Residential week and or RPA Build project and flight test
For those doing Res week, you will complete the Cert 3 (RPA)

Aviation Australia to run the res school

Kits to be provided

Build Project Due: Week 11 Friday (26 May 2023) 5:00 pm AEST
Flight test Due: Week 11 Friday (26 May 2023) 11:00 pm AEST

Week 12 - 29 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
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Summary and Assessment for Cert III

Aviation Australia

Exact dates to be advised.

Review/Exam Week - 05 Jun 2023

Module/Topic	Chapter	Events and Submissions/Topic
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Exam Week - 12 Jun 2023

Module/Topic	Chapter	Events and Submissions/Topic
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Assessment Tasks

1 Online Quizzes

Assessment Type

Online Quiz(zes)

Task Description

Eight open-book online quizzes designed to assess your skills in locating, reviewing, and applying information from lectures and relevant online sources. Each quiz consists of 10 multiple-choice questions. You have 20 minutes to complete each quiz.

Each quiz will be open on Wednesday at 5.00pm and will close the following Wednesday at 5.00pm. There will be a link to each quiz in Moodle

Number of Quizzes

8

Frequency of Quizzes

Weekly

Assessment Due Date

Each quiz is due every Wednesday for the first 8 lectures. It is sat online through Moodle

Return Date to Students

Each quiz is automatically marked immediately after sitting it.

Weighting

30%

Assessment Criteria

Quizzes 1-8 will assess knowledge from Lectures 1-8, which include:

- 1.RPA Applications
- 2.Infotechnological devices
- 3.RPA-hardware
- 4.RPA-software, sensors, telemetry
- 5.RPA Knowledge-Fixed wing
- 6.RPA Knowledge-Rotary wing
- 7.Automated vs autonomous flight management systems
- 8.RPA Navigation

Weighting is 30%

Referencing Style

- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

Submission

Online

Submission Instructions

Online

Learning Outcomes Assessed

- Compare different types of Remote Piloted Aircraft Systems applications, associated structural devices, and their integration into a working unit
- Reflect and report on the impact of the various navigation systems, human factors, and meteorology on Remote Piloted Aircraft operations

2 Written Assignment

Assessment Type

Written Assessment

Task Description

The Remotely Piloted Aircraft System (RPAS) industry is constantly evolving, and research helps drive innovation by exploring new technologies and methods for building and using RPAS. This can lead to the development of new applications for RPAS and expand the market for RPAS-based products and services.

Identify six (6) RPAS hardware components and investigate how by understanding their functions, researchers can develop new and improved versions to enhance the performance of RPAS.

Use the following structure:

1. Introduction

Provide an overview of the study, including

- a. The background and context of the study
- b. The purpose and objectives of the research

2. Main Body

- a. Identify the six components
- b. Describe how each component functions
- c. Explain the influence each component has on the components it is attached to

- d. Discuss what innovative modifications can be applied to the RPAS componentry to improve performance and safety
 - e. Use diagrams, schematics or photos to clarify your discussion
3. Conclusion
- a. provide a conclusion as to how, by understanding RPAS componentry and functions, researchers can develop new and improved versions to enhance the performance of RPAS.

Assessment Due Date

Week 4 Wednesday (29 Mar 2023) 11:00 pm AEST

Upload to Moodle

Return Date to Students

Week 5 Wednesday (5 Apr 2023)

online

Weighting

20%

Assessment Criteria

The written assignment will be marked out of 20 marks as follows:

1. Introduction (3 Marks)

Provide an overview of the study, including

- a. The background and context of the study
- b. The purpose and objectives of the research

2. Main Body (15 Marks)

- a. Identify the six components
 - b. Describe how each component functions
 - c. Explain the influence each component has on the components it is attached to
 - d. Discuss what innovative modifications can be applied to the RPAS componentry to improve performance and safety
 - e. Use diagrams, schematics or photos to clarify your discussion
3. Conclusion (2 Marks)
- a. provide a conclusion as to how, by understanding RPAS componentry and functions, researchers can develop new and improved versions to enhance the performance of RPAS.

4. Referencing Style is to be American Psychological Association 7th Edition (APA 7th edition)

Referencing Style

- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

Submission

Online

Submission Instructions

Upload into Moodle under Assignment 2.

Learning Outcomes Assessed

- Compare different types of Remote Piloted Aircraft Systems applications, associated structural devices, and their integration into a working unit
- Demonstrate problem-solving skills by assembling components, and operating and maintaining a Remote Piloted Aircraft System
- Reflect and report on the impact of the various navigation systems, human factors, and meteorology on Remote Piloted Aircraft operations

3 Build Project

Assessment Type

Project (applied)

Task Description

Work in groups of 2-3 to build the Eachine Tyro 79 or 99 from an ensemble of parts. Work together to:

1. assemble the frame
2. Mount the FPV System
3. Mount and power the receiver
4. Mount the motors
5. Mount the PDB
6. Mount and wire the Flight Controller
7. Complete a "Continuity test"
8. Test the FPV system
9. Complete the build

10. Configure software (use BetaFlight)
11. Final Test including a flight test
12. Take a video of each step and once finished upload video into Moodle under "Assignment 3"

Assessment Due Date

Week 11 Friday (26 May 2023) 5:00 pm AEST
Upload video to Moodle under Assignment 3"

Return Date to Students

Week 12 Friday (2 June 2023)
Online

Weighting

30%

Assessment Criteria

The build project will be marked out of 30 Marks as follows:

1. assemble the frame - 2 Marks
2. Mount the FPV System - 2 Marks
3. Mount and power the receiver - 2 Marks
4. Mount the motors - 2 Marks
5. Mount the PDB - 2 Marks
6. Mount and wire the Flight Controller - 2 Marks
7. Complete a "Continuity test" - 3 Marks
8. Test the FPV system - 3 Marks
9. Complete the build - 2 Marks
10. Configure software (use BetaFlight) - 4 Marks
11. Final Test including a flight test - 4 Marks
12. Take a video of each step and once finished upload video into Moodle under "Assignment 3" - 2 Marks

Referencing Style

- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

Submission

Online Group

Submission Instructions

upload video to Moodle

Learning Outcomes Assessed

- Demonstrate problem-solving skills by assembling components, and operating and maintaining a Remote Piloted Aircraft System
- Build and fly a Remote Piloted Aircraft safely and competently
- Provide evidence of a professional capacity to communicate, work and learn individually and in a team by completing a mini-project.

4 Flight test

Assessment Type

Practical Assessment

Task Description

Carry out a flight test that includes the following steps:

1. Preparation:
2. Pre-flight checks:
3. Take-off:
4. Basic flight maneuvers
5. Landing:
6. Post-flight inspection:

Students doing the flight test remotely must submit a video showing the test

Assessment Due Date

Week 11 Friday (26 May 2023) 11:00 pm AEST
Aviation Australia to assess or those not attending Res Week to upload video into Moodle

Return Date to Students

Week 12 Friday (2 June 2023)

Online

Weighting

20%

Assessment Criteria

This assessment will be marked out of 20 Marks as follows:

1. Preparation: - 2 Mark
2. Pre-flight checks: - 1 Mark
3. Take-off: - 5 Mark
4. Basic flight maneuvers - 5 Mark
5. Landing: - 5 Mark
6. Post-flight inspection: - 2 Mark

Students doing the flight test remotely must submit a video showing the test

Referencing Style

- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

Submission

Offline Online

Submission Instructions

Offline for students doing Res School. Online upload into Moodle of video for remote students

Learning Outcomes Assessed

- Build and fly a Remote Piloted Aircraft safely and competently
- Provide evidence of a professional capacity to communicate, work and learn individually and in a team by completing a mini-project.

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