AGRI13008 *Agriculture Technology Transformation: The Future of Food and Fibre*
Term 2 - 2023

Profile information current as at 26/04/2024 02:35 am

General Information

Overview

In this unit you will explore advanced digital technologies and their application to agriculture. Agricultural technology (Agri-tech) is one of the fastest developing industries, with new innovations regularly becoming available to improve the understanding of agricultural systems and production and environmental sustainability. You will learn the basic concepts underpinning the operation of sensors, communication platforms and data management systems and will be exposed to both established and emerging technology innovations. You will use a wide range of agri-tech to collect and analyse data, and provide recommendations for application of the technology in the context of intensive and extensive plant and animal production industries. You will explore the social adoption, economic and legislative issues related to these rapidly developing technologies. As well as gaining a theoretical understanding, you will practise using a range of sensor hardware, software and analysis systems, providing you with essential skills as an agricultural professional.

Details

Career Level: *Undergraduate*
Unit Level: *Level 3*
Credit Points: *6*
Student Contribution Band: *7*
Fraction of Full-Time Student Load: *0.125*

Pre-requisites or Co-requisites

Students must have completed a minimum of 72 credit points to enrol in this unit.
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 2 - 2023

- Bundaberg
- Emerald
- 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).

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: 25%
2. **Portfolio**
Weighting: 35%
3. **Written Assessment**
Weighting: 40%

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 Unit Comments

Feedback

A marking rubric or marking sheet would help to make assessment requirements more clear.

Recommendation

A marking rubric will be provided for the written assessment.

Feedback from SUTE Unit Comments

Feedback

The use of more technology links would help students to understand the technologies being discussed.

Recommendation

More links to the relevant technologies will be provided on the Moodle page.

Unit Learning Outcomes

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

1. Explain the basic principles and development of precision agriculture management for plant and animal production systems
2. Discuss the scientific concepts underpinning sensors and radio communication platforms
3. Explain how collecting, managing, analysing and visualising data can improve decision making in plant and animal production systems
4. Map and assess agricultural landscapes using appropriate technologies
5. Critique digital technologies and make specific recommendations for use in agricultural industries.

Alignment of Learning Outcomes, Assessment and Graduate Attributes

— N/A Level ◦ Introductory Level • Intermediate Level • Graduate Level ◦ Professional Level ◦ Advanced Level

Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes				
	1	2	3	4	5
1 - Online Quiz(zes) - 25%	•	•	•	•	•
2 - Portfolio - 35%			•	•	•
3 - Written Assessment - 40%	•		•	•	•

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					

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
1 - Online Quiz(zes) - 25%	•	•	•	•		•		•		
2 - Portfolio - 35%	•	•	•	•		•		•		
3 - Written Assessment - 40%	•	•	•	•		•		•		

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)
- Zoom Capacity (microphone required; webcam optional)
- Microsoft Excel and Word

Referencing Style

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

Teaching Contacts

Tieneke Trotter Unit Coordinator
t.trotter@cqu.edu.au

Schedule

Week 1 - 10 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
Introduction and overview of ag tech	There is no prescribed text book for this unit. Readings and additional materials will be provided each week on the Moodle site.	

Week 2 - 17 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
Geolocation and identification		

Week 3 - 24 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
Remote and proximal sensing		

Week 4 - 31 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
Machine vision		

Week 5 - 07 Aug 2023

Module/Topic	Chapter	Events and Submissions/Topic
Movement and motion sensors		**Farm Mapping** Due: Week 5 Friday (11 Aug 2023) 5:00 pm AEST

Vacation Week - 14 Aug 2023

Module/Topic	Chapter	Events and Submissions/Topic

Week 6 - 21 Aug 2023

Module/Topic	Chapter	Events and Submissions/Topic
Weight and force sensors		**Online Quiz 1** Open: Week 6 Tuesday (22 August, 2023) Close: Week 7 Monday (28 August, 2023) 5:00 pm AEST.

Week 7 - 28 Aug 2023

Module/Topic	Chapter	Events and Submissions/Topic
Environmental monitoring		

Week 8 - 04 Sep 2023

Module/Topic	Chapter	Events and Submissions/Topic
Communication technologies		

Week 9 - 11 Sep 2023

Module/Topic	Chapter	Events and Submissions/Topic
Data management and analysis for decisions		

Week 10 - 18 Sep 2023

Module/Topic	Chapter	Events and Submissions/Topic
Automation and remote management		

Week 11 - 25 Sep 2023

Module/Topic	Chapter	Events and Submissions/Topic
Extension and adoption		**Agricultural Technology Review** Due: Week 11 Friday (29 Sept 2023) 5:00 pm AEST

Week 12 - 02 Oct 2023

Module/Topic	Chapter	Events and Submissions/Topic
Overview and debunk of the ag tech industry		**Online Quiz 2** Open: Week 12 Tuesday (3 October, 2023) Close: Week 13 Monday (9 October, 2023) 5:00 pm AEST.

Review/Exam Week - 09 Oct 2023

Module/Topic	Chapter	Events and Submissions/Topic

Exam Week - 16 Oct 2023

Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 Online Quizzes

Assessment Type
Online Quiz(zes)

Task Description

Online Quiz 1 (12.5%) Open: Week 6 Tuesday (22 August, 2023) 5:00 pm AEST. Close: Week 7 Monday (28 August, 2023) 5:00 pm AEST.

This quiz will assess your understanding of content and readings delivered in Weeks 1 to 6. The quiz will consist of a variety of questions which might include multiple choice, matched pairs and calculations.

Online Quiz 2 (12.5%) Open: Week 12 Tuesday (3 October, 2023) 5:00 pm AEST. Close: Week 13 Monday (9 October, 2023) 5:00 pm AEST.

This quiz will assess your understanding of content and readings delivered in Weeks 7 to 12. The quiz will consist of a variety of questions which might include multiple choice, matched pairs and calculations.

Number of Quizzes
2

Frequency of Quizzes
Other

Assessment Due Date

Online Quiz 1 (12.5%) Open: Week 6 Tuesday (22 August, 2023). Close: Week 7 Monday (28 August, 2023) 5:00 pm AEST. Online Quiz 2 (12.5%) Open: Week 12 Tuesday (3 October, 2023). Close: Week 13 Monday (9 October, 2023) 5:00 pm AEST.

Return Date to Students

Results returned when the quiz is closed.

Weighting
25%

Minimum mark or grade
50%

Assessment Criteria
The responses to these questions will be assessed according to their quality, accuracy and level of detail.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
Online

Learning Outcomes Assessed

- Explain the basic principles and development of precision agriculture management for plant and animal production systems
- Discuss the scientific concepts underpinning sensors and radio communication platforms
- Explain how collecting, managing, analysing and visualising data can improve decision making in plant and animal production systems
- Map and assess agricultural landscapes using appropriate technologies
- Critique digital technologies and make specific recommendations for use in agricultural industries.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence
- Ethical practice

2 Farm Mapping

Assessment Type
Portfolio

Task Description
The portfolio consists of two parts:
Part A (15%) Farm map and recommendations
You will create a farm map within a nominated cloud-based farm management GIS platform. You will select a property known to you and input the location into the GIS platform. You will map the individual paddocks across the farm. When the property location and paddocks are identified, you will download satellite imagery and undertake basic analysis by converting the satellite image to and NDVI map. Using the NDVI map, you will provide recommendations for field scouting of the sub-paddock variability in plant productivity to explore opportunities for site specific management. You will provide a report (600 words excluding references, figures and captions) including:

- introduction to the property, where is it and what is the farming system
- the farm map, boundaries and paddocks with satellite image
- the NDVI map, boundaries and paddocks
- recommendations for scouting sub-paddock variability
- opportunities for site specific management

Part B (20%) Instructional video
Record a 5 minute audio-visual instructional session explaining to the land manager the basics of using the cloud-based farm mapping platform. Provide guidance on how the satellite data can be used and provide recommendations for actions to be considered by the farmer.

Assessment Due Date
Week 5 Friday (11 Aug 2023) 5:00 pm AEST

Return Date to Students
Week 7 Friday (1 Sept 2023)

Weighting
35%

Minimum mark or grade
50% of the overall assessment.

Assessment Criteria
The farm mapping portfolio will be assessed on:
Part A (15%) Farm map and recommendations

- Content detail, accuracy and quality of the information
- Presentation of map, information, images and data in appropriate figures, tables and graphs
- The clarity of English expression, spelling and grammar
- The appropriate use of references
- Word limit (400 words)

Part B (20%) Instructional video

- Content detail, accuracy and quality of the information
- Appropriate use of slides or cloud-based farm mapping program
- Relevant recommendations
- Clear and professional video suitable for presentation to land managers/farmers
- Time limit (5 minutes)

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
Submit Part A and Part B separately, Part A will be in a .pdf or .docx format or similar. Part B will be an audio-visual recording which can be recorded in PowerPoint, Zoom or similar.

Learning Outcomes Assessed

- Explain how collecting, managing, analysing and visualising data can improve decision making in plant and animal production systems
- Map and assess agricultural landscapes using appropriate technologies
- Critique digital technologies and make specific recommendations for use in agricultural industries.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence
- Ethical practice

3 Agricultural Technology Review

Assessment Type
Written Assessment

Task Description
This assessment task requires you to select a technology suitable for the assessment of agricultural landscapes or a production system of interest, either demonstrated throughout term or through independent research. You will produce a 1500 word review of the technology which explains how the technology works (how does it collect data), how the technology is used, how the data is managed, analysed or visualised and how decision making can be improved through its use. You need to provide a critique of the technology and make recommendations for use to improve an aspect of a specific agricultural industry or production system.
The report will include:

- Title - nominate the chosen technology
- Introduction (150 words)

- How does the technology work - how does it collect data (250 words)
- How is the technology used and how is the data managed, analysed or visualised (300 words)
- How can decision making be improved through the use of data from this technology (300 words)
- Benefits and limitations of the technology (300 words)
- Recommendations for the use of this technology in a specific agricultural industry or production system (200)
- References (not included in word count)

Assessment Due Date
Week 11 Friday (29 Sept 2023) 5:00 pm AEST

Return Date to Students
Review/Exam Week Friday (13 Oct 2023)

Weighting
40%

Minimum mark or grade
50%

Assessment Criteria
The technology review will be assessed on:

- Content detail, accuracy and quality of the information outlined in the task description
- Presentation of information, images and data in appropriate figures, tables and graphs
- The clarity of English expression, spelling and grammar
- The appropriate use of references
- Word limit (1500 words)

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
Online

Learning Outcomes Assessed

- Explain the basic principles and development of precision agriculture management for plant and animal production systems
- Explain how collecting, managing, analysing and visualising data can improve decision making in plant and animal production systems
- Map and assess agricultural landscapes using appropriate technologies
- Critique digital technologies and make specific recommendations for use in agricultural industries.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence
- Ethical practice

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