



AGRI11001 Soil and Irrigation Management

Term 1 - 2017

Profile information current as at 07/05/2024 07:51 am

All details in this unit profile for AGRI11001 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

This unit covers the fundamentals of soil and water systems, integrating the VET competency units 'Monitor and manage soils for production' and 'Managing water systems'. You will learn how soil properties affect crop growth; how management strategies can be applied to manage variable soil conditions; how to interpret soil analytical data and how to develop soil improvement programs. The unit will show you how different growing conditions define management options and how a range of irrigation systems can be used to increase production.

Details

Career Level: *Undergraduate*

Unit Level: *Level 1*

Credit Points: 6

Student Contribution Band: 7

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

There are no requisites for 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 1 - 2017

- Bundaberg
- Emerald
- 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. **Portfolio**

Weighting: 40%

2. **Practical and Written Assessment**

Weighting: 20%

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 Students and CQU staff

Feedback

The students and CQU staff indicated poor indication of due dates and poor feedback on assessments.

Recommendation

The Portfolio and other assessments will be broken into smaller parts, with their own due dates, throughout the term: 1) so that students can receive feedback as term progresses; and 2) to ensure submission and marking occur in a timely manner distributed throughout the term.

Action

The portfolio was divided into 2 on-line quizzes.

Feedback from CQU Staff

Feedback

CQU staff indicated the need for assessment scaffolding.

Recommendation

QATC needs to take on full delivery of pracs in all locations, CQU needs to have more input into prac/lecture materials. Smaller portfolio and assessment tasks will allow CQU and QATC to scaffold assessments during the term.

Action

QATC coordinated delivery of pracs at each campus

Feedback from Students

Feedback

The students indicated that the assessments were poorly explained.

Recommendation

The inclusion of a rubric and exemplar for most assessments will be provided on the moodle site at the beginning of term. Better coordination among CQU and QATC staff when explaining assessments will be undertaken so all faculty and staff are giving students at all campuses the same instructions. Questions about assessments should be directed toward the course coordinator through the moodle discussion pages or through email.

Action

Guidance for all assessment items was provided to the class. Heavy reliance on quizzes made it difficult to produce useful rubrics. Practice quizzes were set.

Feedback from Students

Feedback

The students indicated the need for a better organization (e.g. timetable, assessments).

Recommendation

All portfolio tasks and assessments need to have clear and unambiguous due dates posted in the course profile and on moodle. Assessment names, due dates and terminology must be aligned between the course profile and the moodle site. Both CQU and QATC staff will be more rigid in following the posted schedule of lectures, pracs, labs and field trips. We will still need to remain flexible for unforeseen circumstances.

Action

Assessment due dates were posted on moodle at the start of the term. The posted assessment and teaching schedule were followed apart from 2 weeks where cyclone/floods forced campus closures.

Feedback from CQU staff and students

Feedback

The students and CQU staff indicated that some content was repetitive and overlaps with other courses (e.g. content overlap with 11002).

Recommendation

CQU and QATC staff will work to reduce unintentional repetition and instead scaffold learning outcomes across the Agriculture program. This may include project based learning assessments that supplement or replace the current assessments.

Action

Unit content was revised to avoid repetition.

Unit Learning Outcomes

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

1. Use soil testing information to describe different soil types.
2. Explain how soil properties determine production opportunities.
3. Develop, monitor and review soil amendment practices.
4. Determine the feasibility of using or upgrading irrigation systems.
5. Develop and evaluate an appropriate irrigation plan.

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes				
	1	2	3	4	5
1 - Portfolio - 40%	•	•	•	•	•
2 - Practical and Written Assessment - 20%				•	•
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 - Portfolio - 40%	•	•	•	•	•	•				
2 - Practical and Written Assessment - 20%	•	•	•			•				
3 - Written Assessment - 40%	•	•	•	•		•				

Textbooks and Resources

Textbooks

There are no required textbooks.

Additional Textbook Information

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

Philip Brown Unit Coordinator
p.h.brown@cqu.edu.au

Schedule

Week 1 - 06 Mar 2017

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

Introduction

Week 1 lecture will explain what soils are made of and why they are important in agriculture. Soil physical, chemical and biological properties will be introduced and the common measures of soil physical properties will be explained.

Lab Practical

Measuring soil physical properties. The practical will train students to undertake standard soil tests for the following physical properties:

- Determine soil texture by feel
- Determine soil structure by careful observation
- Determination of soil colour (Munsell Colour chart)
- Determination of soil aggregate stability
- Measure soil penetration resistance using a penetrometer
- Measure soil bulk density

Week 2 - 13 Mar 2017

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

Soil Chemistry

The week 2 lecture will cover the role that the soil plays in determining the availability of nutrients to plants. Key areas covered will be pH, cation exchange capacity, salinity, sodicity and major nutrients in soils. Techniques for assessing soil chemical characteristics will be reviewed.

Lab Practical

Measuring soil chemical properties. The practical will train students to undertake standard soil tests for the following chemical properties:

- Measure soil pH using different methods
- Measure soil Electrical Conductivity
- Measure soil nitrate concentration
- Interpret a soil chemical test report

Week 3 - 20 Mar 2017

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

Soil Biology

This lecture provides an overview of the living constituents of soil and their importance in 'soil health'. The lecture will cover nutrient cycles, decomposition of organic substrates and soil properties impacted by soil organic matter. Key tests to assess soil biology will be explained.

Prac: Field trip. Students will visit field site(s) and assess soils using the methods covered in the week 1 and 2 practicals. Additional practical skills covered on the field trip will be:

- Visual interpretation of soil characteristics in the field
- Planning a field sampling design and collecting field samples for testing
- Determine earthworm activity
- Assess plant root health
- Measure water infiltration rate

Assessment 1 online text (soil analysis and interpretation) available on Moodle

Week 4 - 27 Mar 2017

Module/Topic	Chapter	Events and Submissions/Topic
Interpreting soil assessment information This lecture will draw together the topics covered in previous weeks on soil physical, chemical and biological properties to explain how soil analysis assessment results can be used to assist in agricultural management. The following soil management practices will be covered: tillage practices (no-tillage or zero tillage, minimum tillage), stubble management, cover cropping and green manure crops, soil amendments, contour/strip farming, controlled traffic farming, and development of irrigation and nutrition plans. Lab Practical Review of soil testing methods covered in weeks 1-3. Examination of 'unknown' soil samples to assess students competence in soil tests and interpretation of results.		

Week 5 - 03 Apr 2017

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

Soil constraints and land degradation.

The week 5 lecture will introduce the major soil degradation issues facing Australian agriculture. These areas include salinity, soil acidification, sodicity, soil structure decline and compaction, water repellence, erosion, and nutrient depletion.

Prac: Field trip. Students will visit field site(s) affected by soil degradation to assess soil characteristics at the sites. Practical skills covered on the field trip include the majority of tests demonstrated in previous weeks. Additional visual assessments such as the presence of indicator plant species will be covered on the field trip.

Vacation Week - 10 Apr 2017

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

Week 6 - 17 Apr 2017

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

Soil water relationships

The lecture in week 6 will explain the concepts of soil water content and water potential, and explain how soil properties affect them. The effect of these soil water relationships on plants will be introduced, along with the common methods used to monitor soil moisture.

Prac: There is no practical class scheduled for week 6

Assessment 1 online test 2 (soil management) available on Moodle

Week 7 - 24 Apr 2017

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

Irrigation Planning

This lecture covers the practice of irrigation to manage the soil moisture content in order to improve crop productivity. The main factors that must be taken into consideration when developing an irrigation plan will be covered, and the key calculations that underpin an irrigation plan will be described.

Prac: Students will be taking a full day field trip covering integration of topics from the cropping, animals and soils/irrigation units. The Soils and Irrigation topics to be covered on the field trip are:

- Determine size of area to be irrigated, confirming soil characteristics and crop water requirements (peak demand)
- Identify water source and quality and legal requirements for water supply.
- Indicate size of pump and duty (volume/time)
- Identify, from visual assessment, site drainage and slope characteristics and ensure detrimental outcomes of irrigation (and water supply) are considered.
- From information provided work out static and dynamic pressures, friction losses and detail appropriate nozzles based on the situation.
- Determine mean application rate and estimate coefficient of uniformity.

Week 8 - 01 May 2017

Module/Topic	Chapter	Events and Submissions/Topic
Irrigation Management This lecture will introduce the main irrigation systems used in Australian agriculture, and describe the operation of these systems. Prac: Field practical. Students will complete a practical irrigation activity: <ul style="list-style-type: none">• Assemble a basic irrigation system as provided• Calculate mean application rate using volume and area of catch cans• Calculate distribution uniformity• Decide on an ideal set up for the irrigation system and test• Investigate dripline as an alternative and evaluate efficiency		On-line short answer tests on soils topics Due: Week 8 Friday (5 May 2017) 11:45 pm AEST

Week 9 - 08 May 2017

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

Challenges and opportunities for irrigated agriculture

The final lecture in the irrigation section of the course examines the issues that have emerged in irrigated agriculture in Australia, and some of the technologies that are becoming available and will likely play a part in the agricultural systems of the future.

Prac: Field trip. Students will visit a commercial irrigation field site and complete the following:

- Choose appropriate pipes, fittings and emitters for an irrigation system
- Become familiar with the RURAL IRRIGATION SYSTEM DESIGN STANDARDS & CODES OF PRACTICE
- Determine RAW and refill point for your situation
- Determine Capacity of the system
- Select appropriate pipes, fittings and emitters.
- Propose a design of your irrigation system.

Assessment 2 (irrigation quiz) available on Moodle

Week 10 - 15 May 2017

Module/Topic	Chapter	Events and Submissions/Topic
Whole farm planning		On-line quiz covering practical and theoretical aspects of irrigation management Due: Week 10 Friday (19 May 2017) 11:45 pm AEST

Week 11 - 22 May 2017

Module/Topic	Chapter	Events and Submissions/Topic
Whole farm planning		

Week 12 - 29 May 2017

Module/Topic	Chapter	Events and Submissions/Topic
Whole farm planning		

Review/Exam Week - 05 Jun 2017

Module/Topic	Chapter	Events and Submissions/Topic
		Irrigation system design report Due: Review/Exam Week Friday (9 June 2017) 11:45 pm AEST

Exam Week - 12 Jun 2017

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

Assessment Tasks

1 On-line short answer tests on soils topics

Assessment Type

Portfolio

Task Description

This assessment is composed of 2 on-line tests covering the content delivered in the Unit on soils. The tests will contain short answer questions covering material for each week's lectures and practical classes. The first test will cover the Soil Analysis and Interpretation topics, and the second test will examine Soil Management. Practice tests will be available on the Unit Moodle site to allow students to familiarize themselves with the assessment format.

Assessment Due Date

Week 8 Friday (5 May 2017) 11:45 pm AEST

The first test will be available to students in week 3 and is recommended to be completed in week 4, while the second test will be available in week 6 and it is recommended that students complete it by week 7. The week 8 date is the final deadline for quiz submission.

Return Date to Students

Week 9 Friday (12 May 2017)

Tests will be marked and marks will be available within 1 week of completion

Weighting

40%

Minimum mark or grade

40%

Assessment Criteria

On-line test answers will be assessed based on the following 3 criteria:

1. knowledge of soil science topics, terms and methods
2. understanding of the scientific basis of soil analysis and soil management
3. ability to communicate knowledge and understanding in a short answer format

Referencing Style

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

Submission

Online

Learning Outcomes Assessed

- Use soil testing information to describe different soil types.
- Explain how soil properties determine production opportunities.
- Develop, monitor and review soil amendment practices.
- Determine the feasibility of using or upgrading irrigation systems.
- Develop and evaluate an appropriate irrigation plan.

Graduate Attributes

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

2 On-line quiz covering practical and theoretical aspects of irrigation management

Assessment Type

Practical and Written Assessment

Task Description

This assessment is an on-line quiz covering the content delivered in the unit on irrigation. The quizzes will contain short answer questions covering material for each weeks lectures and practical classes. Practice quizzes will be available on the Unit Moodle site to allow students to familiarize themselves with the assessment format.

Assessment Due Date

Week 10 Friday (19 May 2017) 11:45 pm AEST

The quiz will be available on the unit moodle site in week 9. On-line access to the quiz will cease at the due date.

Return Date to Students

Week 11 Friday (26 May 2017)

Weighting

20%

Minimum mark or grade

40%

Assessment Criteria

Quiz answers will be assessed based on the following 3 criteria:

1. knowledge of irrigation topics, terms and methods
2. understanding of the scientific basis of irrigation management and irrigation system design
3. ability to communicate knowledge and understanding in a short answer format

Referencing Style

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

Submission

Online

Learning Outcomes Assessed

- Determine the feasibility of using or upgrading irrigation systems.
- Develop and evaluate an appropriate irrigation plan.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Technology Competence

3 Irrigation system design report

Assessment Type

Written Assessment

Task Description

Students are required to submit a written report on an irrigation system design for the case study field site visited in the Unit. The report will document the site characteristics (including soils present), water sources and availability, the crop/pasture that the system is designed to irrigate, and the technical specifications of the irrigation system. A detailed outline of the report requirements will be available on the Unit Moodle site.

Assessment Due Date

Review/Exam Week Friday (9 June 2017) 11:45 pm AEST

Return Date to Students

Exam Week Friday (16 June 2017)

Weighting

40%

Minimum mark or grade

40%

Assessment Criteria

The Report will be assessed using the following 4 criteria:

1. Knowledge of the site factors and irrigation system components that determine an effective irrigation system
2. Analysis of information collected from the site and from the literature to support the irrigation system design recommended in the report
3. Project management skills in acquiring the information needed to complete the irrigation system design
4. Written communication skills

Referencing Style

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

Submission

Online

Learning Outcomes Assessed

- Use soil testing information to describe different soil types.
- Explain how soil properties determine production opportunities.
- Develop, monitor and review soil amendment practices.

Graduate Attributes

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

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