



GEOG13015 *Remote Sensing of Environment*

Term 1 - 2024

Profile information current as at 08/05/2024 03:23 am

All details in this unit profile for GEOG13015 have been officially approved by CQU University 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

Remote sensing is one of the most important and widely applied methods for monitoring natural and built environments. Satellite images help society understand the Earth's atmospheric, terrestrial, and aquatic environments. Information extracted from images is used to map and monitor land cover and biophysical changes (i.e. land-use change, vegetation health, crop yields, ozone concentration, soil moisture). Satellite images are often integrated into Geographic Information Systems (GIS) to support environmental management. In this unit, you will learn the spectral and spatial concepts that underpin multi-band image biophysical classification schemes. You will spend time practising image acquisition, processing and interpretation steps. Given the continued proliferation of satellite and airborne vehicle acquired images, such skills will increasingly be in demand.

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

Completion of 18 credit points

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 - 2024

- 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. **Practical and Written Assessment**

Weighting: 20%

2. **Practical and Written Assessment**

Weighting: 30%

3. **Case Study**

Weighting: 50%

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 spatial, spectral, radiometric and temporal characteristics of remotely sensed data
2. Evaluate the capabilities and limitations of optical, multispectral satellite remote sensing image processing
3. Create maps of selected earth observation parameters using satellite image processing techniques.

Nil

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

| Assessment Tasks | Learning Outcomes | | |
|--|-------------------|---|---|
| | 1 | 2 | 3 |
| 1 - Practical and Written Assessment - 20% | • | | |
| 2 - Practical and Written Assessment - 30% | | • | |
| 3 - Case Study - 50% | | | • |

Alignment of Graduate Attributes to Learning Outcomes

| Graduate Attributes | Learning Outcomes | | |
|---|-------------------|---|---|
| | 1 | 2 | 3 |
| 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.

Additional Textbook Information

Students will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- European Space Agency Satellite Image Processing Software (details to be advised during term)

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

Richard Koech Unit Coordinator
r.koech@cqu.edu.au

Schedule

Week 1 - 04 Mar 2024

| Module/Topic | Chapter | Events and Submissions/Topic |
|-----------------------------|---------|------------------------------|
| Satellite Earth Observation | | |

Week 2 - 11 Mar 2024

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

Week 3 - 18 Mar 2024

| Module/Topic | Chapter | Events and Submissions/Topic |
|---------------------------------|---------|------------------------------|
| Satellite Sensor Specifications | | |

Week 4 - 25 Mar 2024

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

Week 5 - 01 Apr 2024

| Module/Topic | Chapter | Events and Submissions/Topic |
|----------------|---------|--|
| Image Concepts | | Portfolio #1 Due: Week 5 Monday (1 Apr 2024) 9:00 am AEST |

| Vacation Week - 08 Apr 2024 | | |
|---------------------------------------|---------|---|
| Module/Topic | Chapter | Events and Submissions/Topic |
| Week 6 - 15 Apr 2024 | | |
| Module/Topic | Chapter | Events and Submissions/Topic |
| Image Preparation | | |
| Week 7 - 22 Apr 2024 | | |
| Module/Topic | Chapter | Events and Submissions/Topic |
| Image Enhancement | | |
| Week 8 - 29 Apr 2024 | | |
| Module/Topic | Chapter | Events and Submissions/Topic |
| Landcover Classification | | Portfolio #2 Due: Week 8 Monday (29 Apr 2024) 9:00 am AEST |
| Week 9 - 06 May 2024 | | |
| Module/Topic | Chapter | Events and Submissions/Topic |
| Measuring Vegetation Health | | |
| Week 10 - 13 May 2024 | | |
| Module/Topic | Chapter | Events and Submissions/Topic |
| Analysis Accuracy | | |
| Week 11 - 20 May 2024 | | |
| Module/Topic | Chapter | Events and Submissions/Topic |
| Landcover Change Detection | | |
| Week 12 - 27 May 2024 | | |
| Module/Topic | Chapter | Events and Submissions/Topic |
| Earth Observation Options | | |
| Review/Exam Week - 03 Jun 2024 | | |
| Module/Topic | Chapter | Events and Submissions/Topic |
| | | Portfolio #3 Due: Review/Exam Week Monday (3 June 2024) 9:00 am AEST |
| Exam Week - 10 Jun 2024 | | |
| Module/Topic | Chapter | Events and Submissions/Topic |

Assessment Tasks

1 Portfolio #1

Assessment Type

Practical and Written Assessment

Task Description

Portfolio #1 is a submission of short answer questions, worked exercises, and the result of image processing exercises of weeks 2 and 3. The GEOG13015 Moodle site provides detailed assessment task instructions.

Assessment Due Date

Week 5 Monday (1 Apr 2024) 9:00 am AEST

Return Date to Students

Week 6 Monday (15 Apr 2024)

Weighting

20%

Minimum mark or grade

50%

Assessment Criteria

The GEOG13015 Moodle site provides detailed marking criteria – a synopsis of which is:

- Completeness of the answer concerning the learning material;
- Readability/suitability of submitted images/diagrams (tables/figures);
- Within any expressed word limits (noted in the exercise if applicable); and
- Sentence construction, argument structure, and readability of short answers.

Referencing Style

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

Submission

Online

Learning Outcomes Assessed

- Explain spatial, spectral, radiometric and temporal characteristics of remotely sensed data

2 Portfolio #2

Assessment Type

Practical and Written Assessment

Task Description

Portfolio #2 is a submission of short answer questions, worked exercises, and the result of image processing exercises of weeks 4, 5 and 6. The GEOG13015 Moodle site provides detailed assessment task instructions.

Assessment Due Date

Week 8 Monday (29 Apr 2024) 9:00 am AEST

Return Date to Students

Week 10 Monday (13 May 2024)

Weighting

30%

Minimum mark or grade

50%

Assessment Criteria

The GEOG13015 Moodle site also provides detailed marking criteria – a synopsis of which is:

- Completeness of the answer concerning the learning material;
- Readability/suitability of submitted diagrams (tables/figures);
- Within any expressed word limits (noted in the exercise if applicable); and
- Sentence construction, argument structure, and readability of short answers.

Referencing Style

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

Submission

Online

Learning Outcomes Assessed

- Evaluate the capabilities and limitations of optical, multispectral satellite remote sensing image processing

3 Portfolio #3

Assessment Type

Case Study

Task Description

Portfolio #3 is a submission of some short answer questions, worked exercises, and the result of image processing exercises of weeks 7 to 11. The GEOG13015 Moodle site provides detailed assessment task instructions.

Assessment Due Date

Review/Exam Week Monday (3 June 2024) 9:00 am AEST

Return Date to Students

Exam Week Friday (14 June 2024)

Weighting

50%

Minimum mark or grade

50%

Assessment Criteria

The GEOG13015 Moodle site also provides detailed marking criteria - a synopsis of which is:

- The written answers are well structured and engage readers.
- The land cover classified image set is complete and well presented.
- The vegetation index and difference image sets are complete and well presented.
- Short answers reflect an understanding of satellite remote sensing image processing.
- Within any expressed word and submission time limits.

Referencing Style

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

Submission

Online

Learning Outcomes Assessed

- Create maps of selected earth observation parameters using satellite image processing techniques.

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