GEOG12021 *Remote Sensing of Environment*
Term 1 - 2021

Profile information current as at 12/10/2024 07:42 pm

All details in this unit profile for GEOG12021 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

Remote sensing is one of the most important and widely applied methods for monitoring natural and built environments. Satellite images help society understand the atmospheric, terrestrial and aquatic environments of the earth. Information extracted from images may be used in many ways - as a basis for mapping and monitoring changes to features (vegetation communities, soil types, mineral outcrops) and biophysical properties (biomass of forest, crop yields, ozone concentration, soil moisture). Satellite images are often integrated into Geographic Information Systems (GIS) and with other spatial data to support environmental management. You will learn the spectral and spatial concepts that underpin multi-band image biophysical classification schemes. You will spend time practicing image acquisition, processing and interpretation steps. Given the continued proliferation of satellite and airborne vehicle acquired images for efficiently monitoring earth processes – remotely sensed image processing skills will increasingly be in demand.

Details

Career Level: *Undergraduate*
Unit Level: *Level 2*
Credit Points: *6*
Student Contribution Band: *8*
Fraction of Full-Time Student Load: *0.125*

Pre-requisites or Co-requisites

Prerequisite: Minimum of 18 units of credit
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 - 2021

- 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.

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 Student satisfaction survey.

Feedback

Students feedback suggests the use of the European Space Agency satellite image processing sofware was problematic due to 'bugs'.

Recommendation

The European Space Agency continues to update the satellite image processing software. The alternative commercial software is not possible to use in the unit (it costs $1,600 'per seat').

Unit Learning Outcomes

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

1. Describe the electromagnetic radiation theory behind satellite monitoring of the earth
2. Create maps of selected earth observation parameters using satellite image processing techniques
3. Evaluate the limitations of satellite remote sensing image processing for an earth observation application
4. Explain the concepts of spatial, spectral, radiometric and temporal resolutions of remotely sensed data
5. Plan a project that requires analysis of remotely sensed data.

Nil

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 - 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	4	5
1 - Communication		•		•	•
2 - Problem Solving		•			•

Graduate Attributes	Learning Outcomes				
	1	2	3	4	5
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 - Practical and Written Assessment - 20%	•			•		•				
2 - Practical and Written Assessment - 30%	•			•		•				
3 - Case Study - 50%	•	•	•							

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)
- European Space Agency Image Processing Software (students will be guided on where to get this software)

Referencing Style

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

Teaching Contacts

Michael Hewson Unit Coordinator
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Schedule

Week 1 - 08 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Satellite Earth Observation	Readings and resources will be provided by the lecturer each week in the GEOG12021 Moodle site.	

Week 2 - 15 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Lights, Camera, Action!		

Week 3 - 22 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Lights, **Camera,** Action!		

Week 4 - 29 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Lights, Camera, **Action!**		

Week 5 - 05 Apr 2021

Module/Topic	Chapter	Events and Submissions/Topic
Image Concepts		**Portfolio #1** Due: Week 5 Monday (5 Apr 2021) 9:00 am AEST

Vacation Week - 12 Apr 2021

Module/Topic	Chapter	Events and Submissions/Topic

Week 6 - 19 Apr 2021

Module/Topic	Chapter	Events and Submissions/Topic
Image Preparation		

Week 7 - 26 Apr 2021

Module/Topic	Chapter	Events and Submissions/Topic
Image Enhancement		

Week 8 - 03 May 2021

Module/Topic	Chapter	Events and Submissions/Topic
Landcover Classification		**Portfolio #2** Due: Week 8 Monday (3 May 2021) 9:00 am AEST

Week 9 - 10 May 2021

Module/Topic	Chapter	Events and Submissions/Topic
Measuring Vegetation Health		

Week 10 - 17 May 2021

Module/Topic	Chapter	Events and Submissions/Topic
Analysis Accuracy		

Week 11 - 24 May 2021

Module/Topic	Chapter	Events and Submissions/Topic
Landcover Change Detection		

Week 12 - 31 May 2021

Module/Topic	Chapter	Events and Submissions/Topic
Earth Monitoring Options		

Review/Exam Week - 07 Jun 2021

Module/Topic	Chapter	Events and Submissions/Topic
		Portfolio #3 Due: Review/Exam Week Monday (7 June 2021) 9:00 am AEST

Exam Week - 14 Jun 2021

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. A GEOG12021 Moodle site provides detailed assessment task instructions.

Assessment Due Date
Week 5 Monday (5 Apr 2021) 9:00 am AEST

Return Date to Students
Vacation Week Friday (16 Apr 2021)

Comments and marks returned via Moodle 'grades'

Weighting
20%

Assessment Criteria
A GEOG12021 Moodle site also provides detailed marking criteria – a synopsis of which is:

- completeness of the short answer questions concerning the learning material;
- within word limits;
- sentence construction, argument structure and readability of the short answer;
- the degree to which the image processing or worked task fulfils the aim of the exercise; and
- Suitable image presentation standards appropriate to the stage of learning.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
The portfolio will be submitted via the GEOG12021 Moodle site TurnItIn facility.

assessmentOutcome

- Describe the electromagnetic radiation theory behind satellite monitoring of the earth

assessmentGradAttribute

- Communication
- Information Literacy
- Information Technology Competence

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. A GEOG12021 Moodle site provides detailed assessment task instructions.

Assessment Due Date
Week 8 Monday (3 May 2021) 9:00 am AEST

Return Date to Students
Week 9 Friday (14 May 2021)

Comments and marks returned via Moodle 'grades'

Weighting
30%

Assessment Criteria
A GEOG12021 Moodle site also provides detailed marking criteria – a synopsis of which is:

- completeness of the short answer questions concerning the learning material;
- within word limits;
- sentence construction, argument structure and readability of the short answer;
- the degree to which the image processing or worked task fulfils the aim of the exercise; and
- Suitable image presentation standards appropriate to the stage of learning.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
The portfolio will be submitted via the GEOG12021 Moodle site TurnItIn facility.

assessmentOutcome

- Explain the concepts of spatial, spectral, radiometric and temporal resolutions of remotely sensed data

assessmentGradAttribute

- Communication
- Information Literacy
- Information Technology Competence

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. A GEOG12021 Moodle site provides detailed assessment task instructions.

Assessment Due Date
Review/Exam Week Monday (7 June 2021) 9:00 am AEST

Return Date to Students
Exam Week Friday (18 June 2021)

Comments and marks returned via Moodle 'grades'

Weighting
50%

Assessment Criteria
A GEOG12021 Moodle site also provides detailed marking criteria – a synopsis of which is:

- completeness of the short answer questions concerning the learning material;
- within word limits;
- sentence construction, argument structure and readability of the short answer;
- the degree to which the image processing or worked task fulfils the aim of the exercise; and
- Suitable image presentation standards appropriate to the stage of learning.

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
The portfolio will be submitted via the GEOG12021 Moodle site TurnItIn facility.

assessmentOutcome

- Create maps of selected earth observation parameters using satellite image processing techniques
- Evaluate the limitations of satellite remote sensing image processing for an earth observation application
- Plan a project that requires analysis of remotely sensed data.

assessmentGradAttribute

- Communication
- Problem Solving
- Critical Thinking

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