



UNSW

UNSW Course Outline

GEOS2821 Introduction to GIS and Remote Sensing - 2024

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General Course Information

Course Code : GEOS2821

Year : 2024

Term : Term 2

Teaching Period : T2

Is a multi-term course? : No

Faculty : Faculty of Science

Academic Unit : School of Biological, Earth and Environmental Sciences

Delivery Mode : Multimodal

Delivery Format : Standard

Delivery Location : Kensington

Campus : Sydney

Study Level : Undergraduate

Units of Credit : 6

Useful Links

[Handbook Class Timetable](#)

Course Details & Outcomes

Course Description

There has been a rapid growth in the use of digital spatial data in many areas of resource management and the environmental sciences. This course provides both a solid theoretical understanding and a comprehensive practical introduction to the use of geographic information

systems and remote sensing in the analysis of digital spatial data, simple modelling using digital spatial data, and in decision support using commercially available software. Topics covered in the course provide an overview of the use of digital geographic information and earth-resource imagery for a wide range of environmental applications including geology, vegetation and forestry, agriculture, oceanographic and regional and urban analysis.

This course will be conducted through a combination of lectures, computer laboratories and fieldwork. Note: Fieldwork of 2 day's duration will involve forest surveys at the Smiths Lake Field Station and students may incur some personal costs.

Enrolment requirement: 36 UoC of coursework completed.

Course Aims

The main objective of this course is to provide students with the principles of how to use Remote Sensing and Geographical Information Systems to assess and manage real-world issues. The course activities and materials will provide insight into issues such as image processing, integrating geospatial data from a range of sources, and understanding the nature and quality of these data. It will also provide practical training on how to use industry standard software for these concepts and processes.

Relationship to Other Courses

It is estimated that 80% of all data collected have some form of geospatial location information. Almost any course in BEES, and many courses from outside BEES, will be dealing with spatial phenomena. The approaches we deal with in this course allow you to conduct these analyses in a consistent and repeatable manner, using spatial data.

Course Learning Outcomes

| Course Learning Outcomes |
|--|
| CLO1 : Describe how and why geographic data are entered, stored and manipulated using a Geographic Information System (GIS). |
| CLO2 : Obtain, process, and analyse remotely sensed data using industry standard remote sensing and GIS software. |
| CLO3 : Explain the advantages and limitations of geographic information systems and remote sensing approaches as simplifications of reality. |
| CLO4 : Prepare written reports explaining background theory and practical implementation of RS and GIS techniques for solving real world problems. |
| CLO5 : Synthesise and apply research methods based on the recent literature. |

| Course Learning Outcomes | Assessment Item |
|--|---|
| CLO1 : Describe how and why geographic data are entered, stored and manipulated using a Geographic Information System (GIS). | <ul style="list-style-type: none"> • Major Project • Remote Sensing Report • Software training • Final Exam |
| CLO2 : Obtain, process, and analyse remotely sensed data using industry standard remote sensing and GIS software. | <ul style="list-style-type: none"> • Major Project • Remote Sensing Report • Software training • Final Exam |
| CLO3 : Explain the advantages and limitations of geographic information systems and remote sensing approaches as simplifications of reality. | <ul style="list-style-type: none"> • Major Project • Remote Sensing Report • Software training • Final Exam |
| CLO4 : Prepare written reports explaining background theory and practical implementation of RS and GIS techniques for solving real world problems. | <ul style="list-style-type: none"> • Major Project • Remote Sensing Report |
| CLO5 : Synthesise and apply research methods based on the recent literature. | <ul style="list-style-type: none"> • Major Project • Remote Sensing Report |

Learning and Teaching Technologies

Moodle - Learning Management System | Microsoft Teams

Learning and Teaching in this course

See additional details document on Moodle

Additional Course Information

See the additional details document on Moodle.

Assessments

Assessment Structure

| Assessment Item | Weight | Relevant Dates |
|---|--------|----------------|
| Major Project Assessment Format: Individual | 50% | |
| Remote Sensing Report Assessment Format: Individual Short Extension: Yes (2 days) | 15% | |
| Software training Assessment Format: Individual | 10% | |
| Final Exam Assessment Format: Individual | 25% | |

Assessment Details

Major Project

Assessment Overview

Throughout the Term you will work towards a major project that integrates the GIS and remote sensing topics covered in the course. You will use the data products generated for the remote sensing report in this work, which is typically due for submission in Week 10.

Feedback: marks and comments from academic staff.

Word count: 4500-6000.

Course Learning Outcomes

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- CLO3 : Explain the advantages and limitations of geographic information systems and remote sensing approaches as simplifications of reality.
- CLO4 : Prepare written reports explaining background theory and practical implementation of RS and GIS techniques for solving real world problems.
- CLO5 : Synthesise and apply research methods based on the recent literature.

Remote Sensing Report

Assessment Overview

You will write a report describing the analysis of remotely sensed data for the Smiths Lake field site. This will include methods from computer labs in weeks 1-4, such as spectral indices and land cover classifications.

Word count: 1500-2000

The task is distributed in Week 1 and is typically due in Week 5. Feedback is provided to students within two weeks of the submission.

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- CLO3 : Explain the advantages and limitations of geographic information systems and remote sensing approaches as simplifications of reality.
- CLO4 : Prepare written reports explaining background theory and practical implementation of RS and GIS techniques for solving real world problems.

- CLO5 : Synthesise and apply research methods based on the recent literature.

Software training

Assessment Overview

You will complete online training modules that will provide you with key skills in geographic information systems. As part of each training course, you will complete a short MCQ quiz to assess your understanding of these skills.

The short quizzes are typically held during Weeks 3, 4 and 7 with feedback on your performance provided.

Course Learning Outcomes

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- CLO2 : Obtain, process, and analyse remotely sensed data using industry standard remote sensing and GIS software.
- CLO3 : Explain the advantages and limitations of geographic information systems and remote sensing approaches as simplifications of reality.

Final Exam

Assessment Overview

You will complete a final exam that covers all course content. The exam is held during the formal exam period and the duration is 2 hours. Questions will include worked examples, annotated diagrams and written responses.

Feedback is available through inquiry with the course convenor.

Course Learning Outcomes

- CLO1 : Describe how and why geographic data are entered, stored and manipulated using a Geographic Information System (GIS).
- CLO2 : Obtain, process, and analyse remotely sensed data using industry standard remote sensing and GIS software.
- CLO3 : Explain the advantages and limitations of geographic information systems and remote sensing approaches as simplifications of reality.

General Assessment Information

See additional details on Moodle.

Grading Basis

Standard

Requirements to pass course

Minimum mark of 40% for the major report, completion of software training modules by end of term

Course Schedule

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

General Schedule Information

See schedule document on Moodle

Course Resources

Prescribed Resources

See additional details document on Moodle

Recommended Resources

See additional details document on Moodle

Additional Costs

There is a cost for the field trip to cover food, accommodation and transport.

Course Evaluation and Development

See additional details document on Moodle

Staff Details

| Position | Name | Email | Location | Phone | Availability | Equitable Learning Services Contact | Primary Contact |
|----------|---------------|-------|----------------|-----------------|----------------|-------------------------------------|-----------------|
| Convenor | Shawn Laffan | | School of BEES | 02 9065 5607 | by appointment | No | Yes |
| Lecturer | Adrian Fisher | | Sameuls G14C | +61 2 9385 3393 | by appointment | No | No |

Other Useful Information

Academic Information

Upon your enrolment at UNSW, you share responsibility with us for maintaining a safe, harmonious and tolerant University environment.

You are required to:

- Comply with the University's conditions of enrolment.
- Act responsibly, ethically, safely and with integrity.
- Observe standards of equity and respect in dealing with every member of the UNSW community.
- Engage in lawful behaviour.
- Use and care for University resources in a responsible and appropriate manner.
- Maintain the University's reputation and good standing.

For more information, visit the [UNSW Student Code of Conduct Website](#).

Academic Honesty and Plagiarism

Referencing is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism.

Further information about referencing styles can be located at <https://student.unsw.edu.au/referencing>

Academic integrity is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits: honesty, trust, fairness, respect, responsibility and courage. At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.

Further information about academic integrity, plagiarism and the use of AI in assessments can be located at:

- The [Current Students site](#),
- The [ELISE training site](#), and
- The [Use of AI for assessments](#) site.

The Student Conduct and Integrity Unit provides further resources to assist you to understand your conduct obligations as a student: <https://student.unsw.edu.au/conduct>

Submission of Assessment Tasks

Penalty for Late Submissions

UNSW has a standard late submission penalty of:

- 5% per day,
- for all assessments where a penalty applies,
- capped at five days (120 hours) from the assessment deadline, after which a student cannot submit an assessment, and
- no permitted variation.

Any variations to the above will be explicitly stated in the Course Outline for a given course or assessment task.

Students are expected to manage their time to meet deadlines and to request extensions as early as possible before the deadline.

Special Consideration

If circumstances prevent you from attending/completing an assessment task, you must officially apply for special consideration, usually within 3 days of the sitting date/due date. You can apply by logging onto myUNSW and following the link in the My Student Profile Tab. Medical documentation or other documentation explaining your absence must be submitted with your application. Once your application has been assessed, you will be contacted via your student email address to be advised of the official outcome and any actions that need to be taken from there. For more information about special consideration, please visit: <https://student.unsw.edu.au/special-consideration>

Important note: UNSW has a “fit to sit/submit” rule, which means that if you sit an exam or submit a piece of assessment, you are declaring yourself fit to do so and cannot later apply for Special Consideration. This is to ensure that if you feel unwell or are faced with significant circumstances beyond your control that affect your ability to study, you do not sit an examination or submit an assessment that does not reflect your best performance. Instead, you should apply for Special Consideration as soon as you realise you are not well enough or are otherwise unable to sit or submit an assessment.

Faculty-specific Information

Additional support for students

- [The Current Students Gateway](#)
- [Student Support](#)
- [Academic Skills and Support](#)
- [Student Wellbeing, Health and Safety](#)
- [Equitable Learning Services](#)
- [UNSW IT Service Centre](#)
- Science EDI Student [Initiatives](#), [Offerings](#) and [Guidelines](#)