



UNSW Course Outline

GEOS3821 Geographic Data Analysis - 2024

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General Course Information

Course Code : GEOS3821

Year : 2024

Term : Term 1

Teaching Period : T1

Is a multi-term course? : No

Faculty : Faculty of Science

Academic Unit : School of Biological, Earth and Environmental Sciences

Delivery Mode : In Person

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

The field of Geographic Information Systems has expanded considerably over the past decade and the world has become very much richer in digital geographic information. Vast amounts of geographic data are routinely collected, with approximately 80% of all data collected having

geographic attributes. This course explores a toolbox of conceptual approaches and methods to model and analyse a range of highly complex, often non-deterministic, geographic problems. It explores a true enabling technology for the natural sciences in addition to a rich source of computational and representational challenges for the computer sciences. This course emphasises a range of GIS and spatial data analysis approaches via a disparate selection of real-world applications.

Assumed knowledge: GEOS2821

Course Aims

The main objective of this course is to provide you with experience in the analysis of spatial data. Through this approach, you will be better equipped to deal with the enormous variety of different applications you will encounter in the workforce.

Relationship to Other Courses

This course explores the application of advanced conceptual approaches and techniques to model and analyse a range of highly complex, often non-deterministic spatial problems. Such approaches are essential for the modern study of many different components of the environmental and geosciences. It provides examples of what can be done using such spatial data, as well as a grounding in how to effectively use such data.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Justify the use of spatial analysis approaches to address geographic problems
CLO2 : Describe and apply the principles of univariate spatial analysis of both continuous-field and discrete-object data
CLO3 : Describe and apply the principles of multivariate spatial analysis of both continuous-field and discrete-object data
CLO4 : Describe and apply the principles of spatio-temporal analysis of discrete event data
CLO5 : Debate the advantages and limitations of the different approaches to analysing spatial data, including spatio-temporal analysis, multivariate, and univariate spatial analysis

Course Learning Outcomes	Assessment Item
CLO1 : Justify the use of spatial analysis approaches to address geographic problems	<ul style="list-style-type: none"> • Major Report • Quiz 2 • Quiz 1 • Project Proposal
CLO2 : Describe and apply the principles of univariate spatial analysis of both continuous-field and discrete-object data	<ul style="list-style-type: none"> • Major Report • Quiz 2 • Quiz 1 • Project Proposal
CLO3 : Describe and apply the principles of multivariate spatial analysis of both continuous-field and discrete-object data	<ul style="list-style-type: none"> • Major Report • Quiz 2 • Quiz 1 • Project Proposal
CLO4 : Describe and apply the principles of spatio-temporal analysis of discrete event data	<ul style="list-style-type: none"> • Major Report • Quiz 2 • Quiz 1 • Project Proposal
CLO5 : Debate the advantages and limitations of the different approaches to analysing spatial data, including spatio-temporal analysis, multivariate, and univariate spatial analysis	<ul style="list-style-type: none"> • Major Report • Quiz 2 • Quiz 1 • Project Proposal

Learning and Teaching Technologies

Moodle - Learning Management System | Microsoft Teams

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Major Report Assessment Format: Individual	60%	
Quiz 2 Assessment Format: Individual	10%	
Quiz 1 Assessment Format: Individual	10%	
Project Proposal Assessment Format: Individual	20%	

Assessment Details

Major Report

Assessment Overview

The major project consists of the application of a set of spatial analysis methods to one or more data sets. The selection of specific analyses you use should be discussed with the lecturer, but should incorporate two of the main types of analysis (e.g. (1) a univariate analysis followed by a multivariate analysis, or (2) a univariate analysis followed by a spatio-temporal).

The report should be structured like an academic journal article and is due for submission in Week 10. Feedback from academic staff is provided within two weeks of submission, in the form of marks and written comments.

Word count: 4500-6000

Course Learning Outcomes

- CL01 : Justify the use of spatial analysis approaches to address geographic problems
- CL02 : Describe and apply the principles of univariate spatial analysis of both continuous-field and discrete-object data
- CL03 : Describe and apply the principles of multivariate spatial analysis of both continuous-field and discrete-object data
- CL04 : Describe and apply the principles of spatio-temporal analysis of discrete event data
- CL05 : Debate the advantages and limitations of the different approaches to analysing spatial data, including spatio-temporal analysis, multivariate, and univariate spatial analysis

Quiz 2

Assessment Overview

You will complete a one hour in-class quiz in week 5 to assess your knowledge of concepts covered in the lectures to that point. The quiz will comprise 4-6 short questions, including diagrams to develop or annotate. You will receive feedback on the same day as the test.

Course Learning Outcomes

- CL01 : Justify the use of spatial analysis approaches to address geographic problems
- CL02 : Describe and apply the principles of univariate spatial analysis of both continuous-field and discrete-object data
- CL03 : Describe and apply the principles of multivariate spatial analysis of both continuous-field and discrete-object data
- CL04 : Describe and apply the principles of spatio-temporal analysis of discrete event data
- CL05 : Debate the advantages and limitations of the different approaches to analysing spatial data, including spatio-temporal analysis, multivariate, and univariate spatial analysis

Quiz 1

Assessment Overview

You will complete a one hour in-class quiz in week 3 to assess your knowledge of concepts covered in the lectures to that point. The quiz will comprise 4-6 short questions, including diagrams to develop or annotate. You will receive feedback on the same day as the test.

Course Learning Outcomes

- CL01 : Justify the use of spatial analysis approaches to address geographic problems
- CL02 : Describe and apply the principles of univariate spatial analysis of both continuous-field and discrete-object data
- CL03 : Describe and apply the principles of multivariate spatial analysis of both continuous-field and discrete-object data
- CL04 : Describe and apply the principles of spatio-temporal analysis of discrete event data
- CL05 : Debate the advantages and limitations of the different approaches to analysing spatial data, including spatio-temporal analysis, multivariate, and univariate spatial analysis

Project Proposal

Assessment Overview

You will develop a short (1500 word) proposal describing the data and analyses you intend to apply for the major report. This will cover the theoretical basis of your proposed analyses, including their potential advantages and limitations. You will also describe the properties of the data you will be analysing.

The task is due in Week 7 with feedback provided within 2 weeks.

Course Learning Outcomes

- CL01 : Justify the use of spatial analysis approaches to address geographic problems
- CL02 : Describe and apply the principles of univariate spatial analysis of both continuous-field and discrete-object data
- CL03 : Describe and apply the principles of multivariate spatial analysis of both continuous-field and discrete-object data
- CL04 : Describe and apply the principles of spatio-temporal analysis of discrete event data
- CL05 : Debate the advantages and limitations of the different approaches to analysing spatial data, including spatio-temporal analysis, multivariate, and univariate spatial analysis

General Assessment Information

Grading Basis

Standard

Course Schedule

Attendance Requirements

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

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
	Shawn Laffan					No	Yes

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](https://student.unsw.edu.au/conduct).

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](#)