UNSW Course Outline

GEOS2721 Australian Physical Environments - 2024

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General Course Information

Course Code : GEOS2721
Year : 2024
Term : Term 3
Teaching Period : T3
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

This course introduces key concepts in geomorphology, sedimentology and soils through the study of landforms and the earth surface processes that create them across a range of environmental settings. Emphasis is on Australian landscapes including rivers and floodplains,

arid regions and coastal zones. Changes to landforms and surface deposits over time and in response to human modification of the landscape are considered. Field and laboratory based work will provide practical experience in physical landscape evaluation and land management techniques for geologists, physical geographers and ecologists.

Note/s: Students will incur personal costs associated with a field trip, typically to the Kiama/ Robertson district on the NSW South Coast (details confirmed during week one).

Course Aims

The aim of this course is to introduce students to the geomorphology, sedimentology and pedology of Australia's physical landscapes with a particular emphasis on Earth surface processes and controls acting in modern-day environments. The course also aims to demonstrate how an understanding of the dynamics of physical environments can be used in environmental reconstruction and to inform effective management strategies for a variety of Australian landscapes. Practical classes and fieldwork reinforce key theoretical concepts and enable students to develop skills in describing and interpreting surface environments, landforms, and soils.

Relationship to Other Courses

GEOS2721 is a level 2 core course for Geography majors and a prescribed elective within Earth Science programs and plans. The course has particular relevance to students undertaking physical geography, environmental science or geology. The course follows on from the following first year courses:

GEOS1111 Investigating Earth and Its Evolution

GEOS1211 Earth and Environmental Science

GEOS1701 Environmental Systems, Processes and Issues

The course is complementary with the following second and third year courses:

GEOS2181 Earth Materials

GEOS2291 Earth's Systems and Sustainability

GEOS2711 Australian Climate and Vegetation

GEOS3281 Applied Geochemistry

GEOS3731 Coastal Processes and Hazards

GEOS3761 Environmental Change

GEOS3911 Environmental Impact Assessment

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Identify and describe features of the Australian physical environment including landforms, sediments and soils.
CLO2 : Explain the creation of physical landscape features in terms of processes and factors across a range of environmental settings.
CLO3 : Predict future changes in different physical landscapes through an evaluation of past environmental changes and human impacts on them.
CLO4 : Apply appropriate field and lab-based techniques to collect physical environment and landform data.
CLO5 : Analyse and interpret field and laboratory data to describe and compare physical environmental systems.
CLO6 : Communicate findings from environmental research clearly and coherently within a management context.

Course Learning Outcomes	Assessment Item
CLO1 : Identify and describe features of the Australian physical environment including landforms, sediments and soils.	• Field trip exercises and report • Final exam • Lab exercises
CLO2 : Explain the creation of physical landscape features in terms of processes and factors across a range of environmental settings.	• Field trip exercises and report • Final exam • Lab exercises
CLO3 : Predict future changes in different physical landscapes through an evaluation of past environmental changes and human impacts on them.	• Field trip exercises and report • Final exam • Lab exercises
CLO4 : Apply appropriate field and lab-based techniques to collect physical environment and landform data.	• Field trip exercises and report • Lab exercises
CLO5 : Analyse and interpret field and laboratory data to describe and compare physical environmental systems.	• Field trip exercises and report • Lab exercises
CLO6 : Communicate findings from environmental research clearly and coherently within a management context.	• Final exam • Field trip exercises and report • Lab exercises

Learning and Teaching Technologies

Moodle - Learning Management System | Blackboard Collaborate | Echo 360

Learning and Teaching in this course

The course design follows the RASE (Resources, Activity, Support and Evaluation) learning model. The **Resources** include: content in lectures and from textbooks, journal articles and digital media; as well as statistical analysis and modelling software; and a variety of analytical instruments. **Activities** include a variety of lab and field-based tasks that require students to actively engage with the resources to complete tasks that demonstrate their achievement of the course learning outcomes. **Support** will be provided by peers (working in groups and online forums), online resources and the use of early formative and summative feedback on students' work and progress. Key aspects of student's work will be **Evaluated** to enable them to improve their learning and become more independent and effective learners. Students will also be involved in the planning processes for many of the activities and their reflection and evaluation of tasks will be used to improve them in future.

The course involves a mix of theoretical and conceptual material delivered in lectures and online materials that are reinforced and complemented through laboratory tasks and skills. The field trip provides a critical synthesis of these two components and is a major focal point of the course whereby students can interpret the landscape using their knowledge base and also through the collection and interpretation of data. The labs and field trip promote an environment of enquiry where students can develop perspectives on the subject matter based upon their own personal experiences and also through interaction with peers.

The timing of the field trip allows students to acquire field based experiences and data collection skills that will then be applied to the necessary theoretical background and approaches to interpretation. The theme of the field trip will be to investigate the changes in the surface processes, landforms and sedimentary environments in a variety of settings including physical landscapes, fluvial systems and estuarine environments. During the field activities, students will partake in a variety of data collection tasks such as measuring and describing landform elements, and describing sediments.

The various assignments will test the knowledge and understanding of geomorphology, sedimentology and pedology in the surficial environment, with a focus on landforms and the processes that shape them. Practical skills in conducting field surveys, laboratory tests and data analysis will also be developed and tested in the course, as well as writing skills that explain and communicate the results. Students will work with a variety of software packages to analyse, manipulate and model data. The course will emulate the type of professional activities that students might be expected to undertake on graduation.

Additional Course Information

The course involves a mix of theoretical and conceptual material delivered in lectures and online materials that are reinforced and complemented through laboratory tasks and skills. The field trip provides a critical synthesis of these two components and is a major focal point of the course whereby students interpret the landscape using their knowledge base and also through the collection and interpretation of data. The field tasks use authentic and real world scenarios to provide an applied basis for material presented in lectures and labs . The labs and field trip promote an environment of enquiry where students can develop perspectives on the subject matter based upon their own personal experiences and also through interaction with peers

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Field trip exercises and report Assessment Format: Individual Short Extension: Yes (1 day)	25%	
Final exam Assessment Format: Individual	30%	
Lab exercises Assessment Format: Individual Short Extension: Yes (1 day)	45%	

Assessment Details

Field trip exercises and report

Assessment Overview

You will be required to participate in a compulsory 3-day field trip that will run early in the term (usually end of week 2). During the field trip, you will be expected to apply a range of skills to collect data in diverse physical environments. Much of this data will be collected as part of team.

Completing the field report will require you to individually analyse and interpret the field data and submit a written report that describes and explains the creation of a variety of landforms and associated surface deposits and soils. Your field report will also include a critical review of relevant theories and approaches to explaining a range of geophysical landscape features and the processes that created them.

The field report will typically be at least 20 pages long (including written material, figures and

tables) and will be due in Week 9 of term.

You will receive written comments and grades on your field report within two weeks of submission.

Course Learning Outcomes

- CLO1 : Identify and describe features of the Australian physical environment including landforms, sediments and soils.
- CLO2 : Explain the creation of physical landscape features in terms of processes and factors across a range of environmental settings.
- CLO3 : Predict future changes in different physical landscapes through an evaluation of past environmental changes and human impacts on them.
- CLO4 : Apply appropriate field and lab-based techniques to collect physical environment and landform data.
- CLO5 : Analyse and interpret field and laboratory data to describe and compare physical environmental systems.
- CLO6 : Communicate findings from environmental research clearly and coherently within a management context.

Generative AI Permission Level

Assistance with Attribution

This assessment requires you to write/create a first iteration of your submission yourself. You are then permitted to use generative AI tools, software or services to improve your submission in the ways set out below.
Any output of generative AI tools, software or services that is used within your assessment must be attributed with full referencing.
If outputs of generative AI tools, software or services form part of your submission and are not appropriately attributed, your Convenor will determine whether the omission is significant. If so, you may be asked to explain your submission. If you are unable to satisfactorily demonstrate your understanding of your submission you may be referred to UNSW Conduct & Integrity Office for investigation for academic misconduct and possible penalties.
For more information on Generative AI and permitted use please see here.

Final exam

Assessment Overview

You will be required to sit a final exam that assesses your knowledge and understanding of the course content.
The exam questions will be in extended response (short essay) format and will cover the entire

range of topics introduced in the course. Questions typically include comparison and contrast of different physical environments and evaluation of the role of different factors and processes in a range of environmental settings.
The exam will typically be of 2 hours duration and will be held in the scheduled exam period at the end of term.
Feedback is available through enquiry with the convenor.

Course Learning Outcomes

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- CLO3 : Predict future changes in different physical landscapes through an evaluation of past environmental changes and human impacts on them.
- CLO6 : Communicate findings from environmental research clearly and coherently within a management context.

Generative AI Permission Level

No Assistance

This assessment is designed for you to complete without the use of any generative AI. You are not permitted to use any generative AI tools, software or service to search for or generate information or answers.
For more information on Generative AI and permitted use please see here.

Lab exercises

Assessment Overview

You will be expected to complete three lab exercises over the term, worth 15% each. The lab exercises require you to collect and analyse data and answer interpretive questions in short written reports.

Topics and skills covered in the lab exercises include:
· aerial imagery and map interpretation;
· topographic surveying;
· description and physical analysis of sediments and soils;
· analysis of hydrologic data.

Some lab exercises may involve work spread across several weeks. Submission of lab exercises

will be scheduled across the term (usually in weeks 2, 7 and 10).

You will receive written comments and grades on all pieces of work submitted.

Model answers and general feedback for each assignment will also be provided.

Course Learning Outcomes

- CLO1 : Identify and describe features of the Australian physical environment including landforms, sediments and soils.
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General Assessment Information

All assessments tasks will be outlined in the first lab class in Week 1 of term. The three main areas of assessment and their requiremnst are outlined below.

Lab Exercises

Three separate lab reports will submitted throughout the term. These will be used to assess a

range of skills such including: air photo & map interpretation; topographic surveying; description of sediments and soils; sediment particle size analysis; analysis of hydrologic data; field data collection techniques and analysis; interpretive questions and writing skills.

Field report

Students will submit a report based upon the field trip. The field trip will be held at the end of Week 3 but the report does not need to be submitted until the end of term. Many of the lab classes will be based on data derived from the field trip and the analysis of this data can be used to complete the field report.

The following criteria will be used to assess the field report:

- critical review of relevant theories and approaches to explaining a range of geophysical landscape features and processes that created them
- collection, analysis and interpretation of a range of data on the formation landforms, sedimentary units and soils

Successful completion of field tasks and a virtual field trip will also be required.

The lab exercises and field report will be submitted online via Moodle and these must comply with formatting and file size requirements.

Final Exam

Understanding and synthesis of course content via a formal written exam held during the final examination period.

Grading Basis

Standard

Requirements to pass course

To pass the course students are expected to:

- satisfactorily complete all assessment tasks, and
- achieve a composite mark of at least 50% across all assessment tasks.

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 0 : 2 September - 8 September	Online Activity	Welcome to course and release of course Moodle page
Week 1 : 9 September - 15 September	Activity	Lecture 1. Overview of physical environments Lab 1 Introduction to course. Introduction to Google Earth and Nearmap. Lecture 2. Australian environments and landform evolution Lab 2. Introduction to landforms using Google Earth and Nearmap Lecture 3. Sydney Basin overview Online: Sydney Basin Formative Lesson
Week 2 : 16 September - 22 September	Activity	Lecture 4. Past Environments and Present Landforms Lab 3. Sydney Basin: Google Earth and VFT Lecture 5. Introduction to fluvial systems Lab 4. Introduction to Surveying Lecture 6. Intro. to stream channel morphology
Week 3 : 23 September - 29 September	Activity	LAB ASSESS 1 Google Earth / VFT Due Monday Wk 3 Lecture 7. Fluvial processes: hydrology & discharge Lab 5. Survey Data Plotting and river reach assessment Lecture 8. Fluvial Processes: Flow Hydraulics Lab 6. Field Trip Briefing Sediment Description Methods Lecture 9. Controls on stream channel morphology Field Trip runs at end of Week 3 Friday 27th – Sunday 29th September inclusive
Week 4 : 30 September - 6 October	Activity	Lecture 10. Fluvial processes: floods Lab 7. Field Trip Data Collation Lecture 11. Floodplains Part 1 Lab 8. Stream channel morphology Lecture 12. Floodplains Part 2
Week 5 : 7 October - 13 October	Activity	Lecture 13. Human impact on rivers (pre-recorded) Public Holiday: No Lab Class Lecture 14. Estuaries: properties and processes Lab 9: Catchment hydrology and stream discharge Lecture 15. Estuary sediments
Week 6 : 14 October - 20 October	Activity	UNSW Flexi Week - no formal classes (students should complete virtual field trip) LAB ASSESS 2 Stream Morphology and Discharge Due Monday Wk 6
Week 7 : 21 October - 27 October	Activity	Lecture 16. Deltas Lab 10. Field Sediment description and Intro to Particle Size Analysis Lecture 17. Properties of sediments Lab 11. Particle size analysis Lecture 18. Sediment Transport
Week 8 : 28 October - 3 November	Activity	Lecture 19. Sediment Transfers Lab 12. PSA Results Lecture 20. Aeolian processes and landforms Lab 13. Flow hydraulics and sediment transport Lecture 21. Australian arid landscapes
Week 9 : 4 November - 10 November	Activity	LAB ASSESS 3 PSA and Sediment Transport Due Monday Wk 9 Lecture 22. Soil properties and formation Lab 14. Soil properties and profile description Part 1 Lecture 23. Soil Ecology Lab 15. Soil properties and profile description Part 2 Lecture 24. Land Degradation
Week 10 : 11 November - 17 November	Activity	Lecture 25. Soil Classification Lecture 26. Spatial Patterns in soils and Soil Landscapes Lab 16. Course Review Field Trip Report Due Friday Wk10

Attendance Requirements

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

General Schedule Information

Attendance in lab classes and on the field trip are compulsory. A compulsory field trip will be held at the end of Week 3 (28 - 30 September inclusive).

It is also recommended that students attend the live lecture sessions. The University expects that all students (domestic and international) be present and available for the entire duration of the UNSW scheduled semester period and associated exam period (22 November - 5 December). Please bear this in mind when making work or travel plans.

Most of the course material is delivered or available online and it is expected that students will have regular access to the internet either via home computer or through personal electronic devices (e.g. mobile phone, iPad, laptop). If you have problems accessing this material please talk to David Edwards about alternative methods of access.

Course Resources

Prescribed Resources

Overall course resources will be outlined and discussed during the first lab class in Week 1 of Term. Specific resources will be identified for each learning activity or assessment task.

Recommended Resources

Students may require access to a PC or laptop to complete tasks outside of scheduled class times.

All reading lists and links to resources will be made available on the course Moodle site.

Additional Costs

A compulsory field trip is a key component of the course. Students may incur costs of up to $200 associated with the field trip.

Course Evaluation and Development

Student feedback is gathered periodically by various means, including My Experience surveys held at the end of term.

Such feedback is considered carefully with a view to acting on it constructively wherever possible and has helped to develop and refine this course. Examples of changes made in response to feedback include:

- changes in number and weighting of assessments
- timing and volume of work required for field and lab tasks have been modified to improve student capacity to complete assessments
- the lab tasks have been more fully integrated with the major field report and broken into two classes per week @ two hours per class.
- feedback on the use of a Virtual Field Trip has been used to improve the latest version and its application to course learning outcomes.
- the field trip has been moved to the first half of the term (was previously too late in the term to allow students to devote sufficient time and resources to the field report).

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	David Edwards		Room 133 Samuels Building	0402114501	During or straight after class times, or by appointment	Yes	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.

Academic Honesty and Plagarism

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