

## GEOS2050: Catchments and Climate

Callaghan

Semester 1 - 2024



THE UNIVERSITY OF  
NEWCASTLE  
AUSTRALIA

## OVERVIEW

### Course Description

Water is vital for life on earth and its abundance or scarcity is driven in part by global climatic cycles and change. The integrated study of climatology (examining long-term weather patterns) and hydrology (exploring water and its interactions) is essential to comprehend the complex processes shaping our planet. This knowledge allows us to navigate the challenges posed by climate change, effectively manage water resources, and understand the potential for natural disasters. Designed for students intrigued by the interactions between the Earth's atmosphere and water systems, this course delves into fundamental principles, unravelling the intricacies of the hydrological cycle and exploring how its processes impact ecosystems and communities. This course aims to equip you with a solid foundation in climatology and hydrology, helping you understand current environmental challenges and contribute to sustainable solutions in the future. Practical skills, such as climate data analysis, hydrological modelling and GIS applications, will also be introduced to provide hands-on experience.

### Academic Progress Requirements

Nil

### Assumed Knowledge Contact Hours

GEOS1040 or GEOS1050 or ENVS1001

#### Callaghan Field Study

Face to Face Off Campus

24 hour(s) per term

Note: There will be 3-4 days of field work.

#### Laboratory

Face to Face On Campus

2 hour(s) per week(s) for 13 week(s) starting Week 1

#### Lecture

Face to Face On Campus

2 hour(s) per week(s) for 13 week(s) starting Week 1

### Unit Weighting Workload

10

Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10 unit course.

# COURSE OUTLINE

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# CONTACTS

<b>Course Coordinator</b>	<b>Callaghan</b> Dr Danielle Verdon-Kidd <a href="mailto:Danielle.Verdon@newcastle.edu.au">Danielle.Verdon@newcastle.edu.au</a> (02) 4921 5749 Consultation: By appointment
<b>Teaching Staff</b>	Other teaching staff will be advised on the course Canvas site.
<b>School Office</b>	<b>School of Environmental and Life Sciences</b> Room C228 Chemistry Building Callaghan <a href="mailto:Science-SELS@newcastle.edu.au">Science-SELS@newcastle.edu.au</a> +61 2 4921 5080 9am-5pm (Mon-Fri)

# SYLLABUS

<b>Course Content</b>	The major themes covered in the course are: <ul style="list-style-type: none"><li>• Recent climate, climate zones and classifications</li><li>• Climate variability and climate change processes</li><li>• The hydrological cycle and Water Resources</li><li>• Hydrological processes including surface and groundwater interactions</li><li>• Hydrological extremes - floods and droughts</li><li>• Palaeoclimatology and palaeohydrology.</li></ul>
<b>Course Learning Outcomes</b>	<b>On successful completion of this course, students will be able to:</b> <ol style="list-style-type: none"><li>1. Explain the fundamental principles of climatology and hydrology, including the processes shaping Earth's climate systems and water cycles.</li><li>2. Critically analyse and interpret climate data, hydrological patterns, and environmental phenomena.</li><li>3. Apply analytical tools to analyse and simulate real-world environmental data for climatological and hydrological applications.</li><li>4. Identify environmental challenges related to climate change, water resource management, and natural disasters.</li><li>5. Collect and effectively communicate geoscientific information.</li></ol>
<b>Course Materials</b>	<b>Lecture Materials:</b> <ul style="list-style-type: none"><li>- Copies of lecture materials will be provided on Canvas</li></ul> <b>Other Resources:</b> <ul style="list-style-type: none"><li>- Readings, media and prac manuals will be provided on Canvas</li></ul>

# COMPULSORY REQUIREMENTS

In order to pass this course, each student must complete ALL of the following compulsory requirements:

## Contact Hour Requirements:

- Field Study Induction Requirement - Students must attend and pass the induction requirements before attending these sessions. In order to participate in this course, students must complete a compulsory fieldwork induction.

# SCHEDULE

Week	Week Begins	Topic	Learning Activity	Assessment Due
1	26 Feb	Introduction to hydroclimatology	Lecture and laboratory	No assessment
2	4 Mar	Catchment characteristics and delineation	Lecture and laboratory	Quiz 1
3	11 Mar	River networks and streams	Lecture and laboratory	Prac Report 1
4	18 Mar	Groundwater hydrology	Lecture, laboratory and field trip	No assessment
5	25 Mar	surface water hydrology	Lecture and laboratory	Quiz 2
6	1 Apr	No lecture or prac due to easter	Lecture and laboratory	Prac Report 2
7	8 Apr	Hydrological Modelling	Lecture and laboratory	Quiz 3 Field Trip Report
<b>Mid-Semester Recess</b>				
<b>Mid-Semester Recess</b>				
8	29 Apr	Putting the climate into hydroclimatology	Lecture and laboratory	Prac Report 3
9	6 May	Hydroclimate spatial variations	Lecture and laboratory	Quiz 4
10	13 May	Hydroclimate temporal variations	Lecture and laboratory	No assessment
11	20 May	Hydroclimate extremes floods and droughts	Lecture and laboratory	Prac Report 4 Quiz 5
12	27 May	Impact of climate change on hydrological processes	Lecture and laboratory	No assessment
13	3 Jun	Palaeoclimatology and palaeohydrology	Lecture and laboratory	Quiz 6
<b>Examination Period</b>				Prac Report 5
<b>Examination Period</b>				

# ASSESSMENTS

This course has 3 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Practicals 1-12	5pm Friday of the week scheduled	Individual	50%	1, 2, 3, 4, 5
2	Field Trip Report	Friday 12th April	Individual	25%	2, 4, 5
3	Quizzes	Quizzes to be completed by 5pm Friday of the week scheduled	Individual	25%	1, 2, 4

## Late Submissions

The mark for an assessment item submitted after the designated time on the due date,

without an approved extension of time, will be reduced by 10% of the possible maximum mark for that assessment item for each day or part day that the assessment item is late. Note: this applies equally to week and weekend days.

## Assessment 1 - Practicals 1-12

<b>Assessment Type</b>	Tutorial / Laboratory Exercises
<b>Purpose</b>	The practical reports will evaluate your ability to complete activities and tasks based on the skills you gain in each lab session and assess your ability to communicate the results of your work in a scientific manner.
<b>Description</b>	Five short reports worth 10% each written in a scientific manner. Each report will have a different focus and be related to one or more of the weekly lab exercises.
<b>Weighting</b>	50%
<b>Due Date</b>	5pm Friday of the week scheduled
<b>Submission Method</b>	Online Turnitin via Canvas
<b>Assessment Criteria</b>	See grading scheme and rubric
<b>Return Method</b>	Online
<b>Feedback Provided</b>	Online - Within 2 weeks of submission (not including break periods).
<b>Opportunity to Reattempt</b>	Students WILL NOT be given the opportunity to reattempt this assessment.

## Assessment 2 - Field Trip Report

<b>Assessment Type</b>	Report
<b>Purpose</b>	The field report is designed to extend students' knowledge of acquisition and assimilation of data and develop key skills in field observation, reflection and analysis, to produce articulate and concise documents which convey evidence-based understanding of the concepts and topics.
<b>Description</b>	The report will highlight the sites visited, methodologies employed, and data collected during hands-on experiences in hydrological fieldwork. The report will also include post field trip analyses of the data, interpretation of the results obtained as well as discussions of implications.
<b>Weighting</b>	25%
<b>Due Date</b>	Friday 12th April
<b>Submission Method</b>	Online Via Turnitin on canvas
<b>Assessment Criteria</b>	See grading scheme and rubric
<b>Return Method</b>	Online
<b>Feedback Provided</b>	Online - Within 2 weeks of submission (not including break periods).
<b>Opportunity to Reattempt</b>	Students WILL NOT be given the opportunity to reattempt this assessment.

## Assessment 3 - Quizzes

<b>Assessment Type</b>	Quiz
<b>Purpose</b>	The purpose of the quizzes is to provide students with regular feedback on student learning associated with the weekly learning material. These tests highlight knowledge gaps and will stimulate discussion with tutors and lecturers during face to face sessions.
<b>Description</b>	6 online quizzes accessed through Canvas. Best 5 of 6 quiz marks taken (5% each)
<b>Weighting</b>	25%
<b>Due Date</b>	Quizzes to be completed by 5pm Friday of the week scheduled
<b>Submission Method</b>	Online Canvas
<b>Assessment Criteria</b>	See grading scheme at start of quiz
<b>Return Method</b>	Online

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<b>Feedback Provided</b>	Online - Feedback provided online within 2 weeks of submission.
<b>Opportunity to Reattempt</b>	Students WILL NOT be given the opportunity to reattempt this assessment.

## ADDITIONAL INFORMATION

### Grading Scheme

This course is graded as follows:

Range of Marks	Grade	Description
85-100	High Distinction (HD)	Outstanding standard indicating comprehensive knowledge and understanding of the relevant materials; demonstration of an outstanding level of academic achievement; mastery of skills*; and achievement of all assessment objectives.
75-84	Distinction (D)	Excellent standard indicating a very high level of knowledge and understanding of the relevant materials; demonstration of a very high level of academic ability; sound development of skills*; and achievement of all assessment objectives.
65-74	Credit (C)	Good standard indicating a high level of knowledge and understanding of the relevant materials; demonstration of a high level of academic achievement; reasonable development of skills*; and achievement of all learning outcomes.
50-64	Pass (P)	Satisfactory standard indicating an adequate knowledge and understanding of the relevant materials; demonstration of an adequate level of academic achievement; satisfactory development of skills*; and achievement of all learning outcomes.
0-49	Fail (FF)	Failure to satisfactorily achieve learning outcomes. If all compulsory course components are not completed the mark will be zero. A fail grade may also be awarded following disciplinary action.

\*Skills are those identified for the purposes of assessment task(s).

### Attendance

Attendance/participation will be recorded in the following components:

- Field Study (Method of recording: Manual)

### Communication Methods

Communication methods used in this course include:

- Canvas Course Site: Students will receive communications via the posting of content or announcements on the Canvas course site.
- Email: Students will receive communications via their student email account.
- Face to Face: Communication will be provided via face to face meetings or supervision.

### Course Evaluation

Each year feedback is sought from students and other stakeholders about the courses offered in the University for the purposes of identifying areas of excellence and potential improvement.

### Oral Interviews (Vivas)

As part of the evaluation process of any assessment item in this course an oral examination (viva) may be conducted. The purpose of the oral examination is to verify the authorship of the material submitted in response to the assessment task. The oral examination will be conducted in accordance with the principles set out in the [Oral Examination \(viva\) Procedure](#). In cases where the oral examination reveals the assessment item may not be the student's own work the case will be dealt with under the [Student Conduct Rule](#).

### Academic Misconduct

All students are required to meet the academic integrity standards of the University. These

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standards reinforce the importance of integrity and honesty in an academic environment. Academic Integrity policies apply to all students of the University in all modes of study and in all locations. For the Student Academic Integrity Policy, refer to <https://policies.newcastle.edu.au/document/view-current.php?id=35>.

**Adverse  
Circumstances**

The University acknowledges the right of students to seek consideration for the impact of allowable adverse circumstances that may affect their performance in assessment item(s). Applications for special consideration due to adverse circumstances will be made using the online Adverse Circumstances system where:

1. the assessment item is a major assessment item; or
2. the assessment item is a minor assessment item and the Course Co-ordinator has specified in the Course Outline that students may apply the online Adverse Circumstances system;
3. you are requesting a change of placement; or
4. the course has a compulsory attendance requirement.

Before applying you must refer to the Adverse Circumstance Affecting Assessment Items Procedure available at:

<https://policies.newcastle.edu.au/document/view-current.php?id=236>

**Important Policy  
Information**

The Help button in the Canvas Navigation menu contains helpful information for using the Learning Management System. Students should familiarise themselves with the policies and procedures

at <https://www.newcastle.edu.au/current-students/respect-at-uni/policies-and-procedures> that support a safe and respectful environment at the University.

*This course outline was approved by the Head of School. No alteration of this course outline is permitted without Head of School approval. If a change is approved, students will be notified and an amended course outline will be provided in the same manner as the original.*

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