UNSW Course Outline

CLIM3001 Climate Systems Science - 2024

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General Course Information

Course Code : CLIM3001
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 : In Person
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Undergraduate
Units of Credit : 6

<u>Useful Links</u>

<u>Handbook</u> <u>Class Timetable</u>

Course Details & Outcomes

Course Description

This course provides a thorough overview of the climate system and its scientific study. In lectures and hands-on lab sessions, the different components of the climate system – including the atmosphere, ocean, biosphere, and cryosphere – are introduced, and their complex

interactions are discussed. These interactions include feedbacks between the Earth's carbon cycle, hydrological cycle, biosphere and key chemical species. The course covers the scientific study of the climate system, including observational approaches and uncertainties; statistical methods used to detect and understand environmental changes; and modelling techniques including idealised models, process models and comprehensive state-of-the-art climate and Earth system models. Students receive hands-on experience in running and interpreting results from a climate model to interrogate changes and interactions in the climate system.

Course Aims

This course aims to give students an understanding of the key systems that control the Earth's climate, how they interact, and the uncertainties associated with direct climate observation and future climate modelling. Lectures and tutorials will provide students with a thorough overview of the different components of the climate system and an appreciation of the range of observational data products that allow us to understand climate processes and the uncertainties associated with sampling and representativeness. The course material will provide an understanding of how climate models are built, executed and evaluated against observations. Tutorial sessions in which students run a climate model and interpret its output will give students the skills required to critically interpret climate model projections and understand key aspects of the uncertainties associated with those projections.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Understand and explain a range of climate phenomena.
CLO2 : Interpret environmental and climate data and recognise their limitations.
CLO3 : Perform calculations of indices of climate phenomena such as El Nino using simple code scripts.
CLO4 : Design experiments with a numerical climate model, run and interpret the output of the model to study climatic changes.
CLO5 : Clearly communicate climate change concepts and results of simulation experiments.

Course Learning Outcomes	Assessment Item
CLO1 : Understand and explain a range of climate phenomena.	• Final exam • Midterm test • Tutorial assessment
CLO2 : Interpret environmental and climate data and recognise their limitations.	• Final exam • Midterm test • Tutorial assessment
CLO3 : Perform calculations of indices of climate phenomena such as El Nino using simple code scripts.	• Final exam • Midterm test • Tutorial assessment
CLO4 : Design experiments with a numerical climate model, run and interpret the output of the model to study climatic changes.	• Research project presentation
CLO5 : Clearly communicate climate change concepts and results of simulation experiments.	• Research project presentation

Learning and Teaching Technologies

Moodle - Learning Management System

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Final exam Assessment Format: Individual	30%	
Research project presentation Assessment Format: Individual	20%	
Midterm test Assessment Format: Individual	20%	
Tutorial assessment Assessment Format: Individual Short Extension: Yes (3 days)	30%	

Assessment Details

Final exam

Assessment Overview

The final examination is 2 hours long and will take place during the term's examination period. The exam will contain short and long-form answer questions; you will be expected to answer all the short-form questions and your choice of several long-form questions. The questions are designed to synthesise and test your knowledge of the course material. Feedback will be provided with the exam marks.

Course Learning Outcomes

- CLO1 : Understand and explain a range of climate phenomena.
- CLO2 : Interpret environmental and climate data and recognise their limitations.
- CLO3 : Perform calculations of indices of climate phenomena such as El Nino using simple code scripts.

Research project presentation

Assessment Overview

The last four tutorial sessions in the course are dedicated to an individual research project. In these tutorials you will be shown how to run a low-resolution coupled climate model and how to adapt the model to answer a scientific question of your choice. You will design your experiment, run the model to obtain results, interpret those results, and present them to the class in the form of a scientific conference presentation. You will be marked on your understanding of the problem, how you contextualise the topic, and the clarity and delivery of your presentation. Feedback will be provided with your marks within two weeks of the presentation.

Course Learning Outcomes

- CLO4 : Design experiments with a numerical climate model, run and interpret the output of the model to study climatic changes.
- CLO5 : Clearly communicate climate change concepts and results of simulation experiments.

Midterm test

Assessment Overview

The midterm test is 2 hours long and is typically scheduled in week 5. The test will contain short and long-form answer questions; you will be expected to answer all the short-form questions and your choice of several long-form questions. The questions are designed to synthesise and test your knowledge of the course material. Feedback will be provided with the test marks.

Course Learning Outcomes

- CLO1 : Understand and explain a range of climate phenomena.
- CLO2 : Interpret environmental and climate data and recognise their limitations.
- CLO3 : Perform calculations of indices of climate phenomena such as El Nino using simple code scripts.

Tutorial assessment

Assessment Overview

During each of the seven tutorials, you will receive a set of problems which you will be expected to complete in your own time and return to the tutor for assessment within two weeks after the tutorial. Tutorials are mostly computer-based but do include some theoretical problems. The tutor will mark your submission and provide feedback. Your average grade across the seven tutorials will be the grade for this assessment component.

Course Learning Outcomes

- CLO1 : Understand and explain a range of climate phenomena.
- CLO2 : Interpret environmental and climate data and recognise their limitations.
- CLO3 : Perform calculations of indices of climate phenomena such as El Nino using simple code scripts.

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
	Tim Raupach					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.

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](#)