School of Environmental and Life Sciences

GEOS1050: Earth: Natural Hazards

Callaghan

Semester 2 - 2023

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

COURSE OUTLINE

OVERVIEW

Course Description

This course covers Earth's natural processes and how these lead to natural hazards that impact society. Starting from geological, environmental, oceanic/hydrological, and climatological systems, this course explores why, when, and how hazards occur and turn into disasters. The course covers the fundamental science behind natural hazards and considers case studies and examples from Australia and around the world. This includes how human activities affect Earth's processes, including climate change, and their relationship with natural hazards. You will learn about the important role of science in providing knowledge that can reduce the current and future risks associated with natural hazards and underpins sustainable human development. The topics covered provide the necessary grounding for continuing studies in Earth, Environmental, Climate, Coastal, Marine, and Spatial Sciences.

Contact Hours

Callaghan
Field Study *
Face to Face Off Campus
16 hour(s) per Term Full Term
Field study comprises of two field days.

Lectorial
Face to Face On Campus
2 hour(s) per Week for 12 Weeks starting Week 1

Practical *
Face to Face On Campus
2 hour(s) per Week for 12 Weeks starting Week 1

* This contact type has a compulsory requirement.

Unit Weighting
10

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

CONTACTS

Course Coordinator

Callaghan
Dr Gabriel Rau
Gabriel.Rau@newcastle.edu.au
(02) 4921 7743
Consultation: Appointment via email.

Teaching Staff

Other teaching staff will be advised on the course Canvas site.

School Office

School of Environmental and Life Sciences
Room C228 Chemistry Building
Callaghan
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+61 2 4921 5080
9am-5pm (Mon-Fri)

SYLLABUS

Course Content

This course examines the natural processes and hazards that occur within Earth systems through the concepts of Earth System Sciences. Topics cover the fundamental Earth science needed to understand natural processes, hazards and disasters, how these could change into the future, and how science can reduce the associated risks. Specific topics include:

- Earth's natural processes including rock, water, and ocean/atmospheric cycles
- Geological hazards (e.g., landslides, earthquakes, volcanoes, tsunamis)
- Environmental hazards (e.g., contamination, pollution)
- Hydrological hazards (e.g., floods and droughts)
- Climatological hazards (e.g., cyclones, storms/wave surges, bushfires, heatwaves)
- The impacts of human activities on natural hazards, including the effects of climate change
- Observing Earth processes and impacts of hazards in time and space

Course Learning Outcomes

On successful completion of this course, students will be able to:

1. Explain Earth's natural processes and how these can lead to natural hazards and disasters;
2. Describe the impacts of natural hazards on environmental, social, and economic systems;
3. Describe how human activities and climate change can affect the size and frequency of natural hazard impacts;
4. Collect, critically analyse, and interpret field and laboratory data related to Earth's natural processes and natural hazards;
5. Communicate geoscientific information effectively;
6. Contribute as part of a team to complete tasks and resolve problems

Course Materials

Lecture Materials:

Course theory content is provided as self-directed Online Learning Material on Canvas. Students are expected to allocate a minimum of two hours each week to engage in this self-directed learning.

Recommended Reading:

Chapman, D., 1999, Natural Hazards, 2nd edition, Oxford University Press [Hardcopy available through the university library]

Readings in Natural Hazards, Open access available here:
https://pressbooks.bccampus.ca/readingsnh/

- See the course Canvas site for additional readings

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.
- Laboratory - There is a compulsory attendance requirement in this course. Students must attend 80% of the laboratory classes.

SCHEDULE

Week	Week Begins	Topic	Learning Activity	Assessment Due
1	17 Jul	Module 1: Geological and planetary hazards Introduction to the course Overview of natural and anthropogenic hazards	Online Learning Material Lectorial Session Practical Session	Fieldwork Medical Questionnaire
2	24 Jul	Module 1: Geological and planetary hazards Earthquakes and volcanoes	Online Learning Material Lectorial Session Practical Session	Quiz 0 (practice quiz)
3	31 Jul	Module 1: Geological and planetary hazards Mass movement & tsunamis	Online Learning Material Lectorial Session Practical Session	Quiz 1 by Monday 12pm
4	7 Aug	Module 1: Geological and planetary hazards Planetary hazards	Online Learning Material Lectorial Session Practical Session	Quiz 2 by Monday 12pm Practical Assessment 1 (completed in lab class)
5	14 Aug	Module 2: Hydrological and climatic hazards Storms and tropical cyclones	Online Learning Material Lectorial Session Practical Session	Quiz 3 by Monday 12pm
6	21 Aug	Module 2: Hydrological and climatic hazards Heatwaves and droughts	Online Learning Material Lectorial Session Practical Session	Quiz 4 by Monday 12pm
7	28 Aug	Module 2: Hydrological and climatic hazards Floods and fires	Online Learning Material Lectorial Session Practical Session	Quiz 5 by Monday 12pm
8	4 Sep	Module 2: Hydrological and climatic hazards Compound weather and climate extremes	Online Learning Material Lectorial Session Practical Session	Quiz 6 by Monday 12pm Practical Assessment 2 (completed in lab class)
9	11 Sep	Module 3: Environmental and human driven hazards Environmental hazards	Online Learning Material Lectorial Session Practical Session Field trip Saturday & Sunday	Quiz 7 by Monday 12pm
10	18 Sep	Module 3: Environmental and human driven hazards Observing hazards from	Online Learning Material Lectorial Session Practical Session	Quiz 8 by Monday 12pm

		space		
Mid Term Break				
Mid Term Break				
11	9 Oct	Module 3: Environmental and human driven hazards Climate change and its impact on hazards	Online Learning Material Lectorial Session Practical Session	
12	16 Oct	Module 3: Environmental and human driven hazards Changes to hazards in the future	Online Learning Material Lectorial Session Practical Session	Quiz 9 by Monday 12pm Practical Assessment 3 (completed in lab class)
13	23 Oct			Quiz 10 by Monday 12pm
Examination Period				
Examination Period				

Note: Students are expected to allocate a minimum of two hours each week to engage in self-directed learning with the Online Learning Material provided on Canvas.

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	Quizzes	Due by 12pm Monday of Weeks 3, 4, 5, 6, 7, 8, 9, 10, 12, 13.	Individual	40%	1, 2, 3
2	Fieldtrip Report	Due by 25 Sept 2023 at 5pm.	Group	20%	1, 2, 3, 4, 5, 6
3	Practical assessments	Completed in class during Practical Sessions of Weeks 4, 8 and 12.	Individual	40%	1, 3, 4, 5

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 - Quizzes

Assessment Type Quiz
Purpose To examine the student's understanding of course theory content, achieving learning outcomes 1, 2 & 3.
Description 10 online quizzes completed in Canvas. Student's highest 9 quiz grades will contribute 40% of their final course grade.
Weighting 40%
Length See Canvas quiz instructions.
Due Date Due by 12pm Monday of Weeks 3, 4, 5, 6, 7, 8, 9, 10, 12, 13.
Submission Method Online
Completed through Canvas.
Assessment Criteria See Canvas quiz instructions.
Return Method Online
Feedback Provided Online - After the due date once quizzes are fully graded. Correct answer and explanation provided.

Assessment 2 - Fieldtrip Report

Assessment Type Report
Purpose To examine the student's understanding of field concepts and skills, achieving learning outcomes 1, 3, 4, 5 & 6.
Description Written assessment on field activities. Field trip arrangements and costs to be communicated via Canvas.
Weighting 20%
Length Instructions provided on Canvas.
Due Date Due by 25 Sept 2023 at 5pm.
Submission Method Online
Submission through Canvas.
Assessment Criteria Provided on Canvas with the assessment instructions.
Return Method Online
Feedback Provided Online - Within 2 weeks after submission. Feedback provided through Canvas.

Assessment 3 - Practical assessments

Assessment Type Tutorial / Laboratory Exercises
Purpose To examine the student's understanding of practical concepts and skills, achieving learning outcomes 1, 3, 4 & 5.
Description In class assessment tasks covering the practical content covered within each module.
Weighting 40%
Length Provided in class with the assessment instructions
Due Date Completed in class during Practical Sessions of Weeks 4, 8 and 12.
Submission Method In Class
Assessment completed in Practical Sessions.
Assessment Criteria Provided in class with the assessment instructions.

Return Method In Class
Feedback Provided In Class - After completion of task. Feedback provided in class or online.

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:

- Practical (Method of recording: Method of recording: MyUni App)

There is a compulsory attendance requirement in this course. Students must attend 80% of the laboratory classes.

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 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/no-room-for/policies-and-procedures that support a safe and respectful environment at the University.

Other Information

The estimated cost of the field trip is $200 and must be paid by each participant. Note that this estimate may vary depending on unforeseeable circumstances.

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.