

**Department of Geology and
School of Geography
University of Otago**

Natural Hazards of New Zealand and Beyond (GEOL 265/365)

Course Outline

Introduction

A natural hazard can be defined as “a natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption or environmental damage” (United Nations International Strategy for Disaster Reduction, 2009a). In this course we will: (1) examine the physical basis for the natural hazards of earthquake, volcano, mass movement, tsunami, extreme flood, extreme drought, severe storm, and environmental change; and (2) examine the impact and consequences of these hazards for the human activity system (risk). While our main focus will be on the natural hazard-scape of New Zealand, we will also examine international examples and case histories where necessary.

Course objectives

The objectives of this course are to:

- Provide integrated conceptual frameworks for the study of natural hazards
- Provide an understanding of the differences between hazard and risk
- Understand how hazards are quantified, including the statistical basis for extreme events
- Understand the concept of multi-hazards
- Explore the societal dimensions of hazards; including how hazards are perceived by humans, how humans can mitigate hazards and how society can adjust to minimise the losses from hazards

Course outcomes

By the end of the course you should have gained understandings of the following:

- The physical basis for natural hazards
- How society approaches hazard management in terms of disaster risk reduction, response planning, and community-led preparedness measures.

- The differences between hazard and risk
- How hazards are quantified
- Evaluating and communicating the nature of natural hazards through theoretical frameworks and case studies

Assessment

Course assessment consists of:

Assessment task	Geol 265	Geol365
A lab programme	60%	40%
Case study assignment	-	20%
2 hour examination	40%	40%

Lab reports should be emailed to the appropriate demonstrator within one week of completing the exercise. Guidelines on the structure and length of lab reports can be found in the lab manual. In the unlikely case that your work becomes misplaced during marking it is recommended that you always make sure you retain a copy of all submitted assignments.

Geol 365 independent assignment

If you are enrolled in Geol 365 you are required to undertake an independent piece of research and produce a written report. We will provide more guidance on topic areas once the course commences, and you should seek advice from one of the course lecturers before you select your research topic.

Drawing examples from case study of a natural hazard that has occurred in the last 10 years in New Zealand or elsewhere explain how the hazard can be understood as an interaction between a natural event system and a human activity system.

Reports will be expected to address the following:

- *Physical basis for the hazard(s) addressed*
- *Social context for the hazard(s) addressed*
- *Human contribution to the hazard(s) addressed*
- *Community and organisational preparedness and resilience*

Your report should be no longer than 3000 words, and will be worth 20% of your grade (see assessment summary above). You will also be required to provide a 5 minute summary of your findings in the final lab class (see lab schedule, below).

The assignment is due on May 22nd at 5pm.

The 5 minute oral summary is scheduled for the May 25 or May 27 labs.

Late submission of work

There will be a late penalty of 10% per day (compounded)

Example 1 mark 60%
1 day late adjusted mark= $60 \times 0.90 = 54\%$

Example 2 mark 75%
4 days late adjusted mark= $75 \times 0.904 = 49\%$

Impairments

If you have an impairment (a condition or event that impacts your academic performance) that affects your study in this paper, it would be helpful to inform the lecturer or demonstrator so that they can make any adaptations in teaching and learning strategies and resources that may be necessary. Disability support is also available (see below).

Grade Scale

All assessment will be graded using the University of Otago grading scale, which is summarised below. Written assignments from most labs are graded by lab demonstrators, who will be assigned the responsibility of grading specific lab exercises. To ensure consistency of marking, all work is marked according to a fixed schedule, set by the academic staff. In the instance that you wish to query your final grade, you should first read the feedback provided by the demonstrators, and follow-up with questions and a discussion about the awarded grade. In the rare instance that you require further guidance, you should make an appointment to discuss your grade with the relevant academic staff member, and can formally request a re-mark of the piece of assessment. Any re-marking of assessments is done “blind”, that is, two markers will be assigned to re-mark the piece of assessment without seeing the original grade or comments, and without consultation. The re-marked grades are collated by the academic staff, and the highest remarked grade is awarded. It should be noted that re-marking is final and no further challenge can be made, and the outcome may be: no change, a lower grade, or a higher grade.

Grade	%	Description	Meaning
A+	>89	Outstanding	Fulfil the grading criteria to an outstandingly high standard
A	80-84	Excellent	Fulfil all the grading criteria to a very high standard consistently
A-	80-84	Verges on Excellent	Fulfil the grading criteria to a high standard but not consistently
B+	75-79	Very Good	Fulfil most of the grading criteria to a very good standard
B	70-74	Good	Fulfil most of the grading criteria to a good standard but not consistently
B-	65-69	Very Reasonable	Fulfil most of the grading criteria but not consistently
C+	60-64	Reasonable	Fulfil some of the grading criteria to a competent standard
C	55-59	Fair	Fulfil some of the grading criteria to a competent standard, not consistently
C-	50-54	Marginal	Fulfil some of the grading criteria to an adequate standard
D	40-49	Inadequate - Fail	Fails to fulfil enough of the grading criteria to a competent standard
E	<40	Fail	Fails to fulfil enough of the grading criteria to a competent standard

Academic integrity and academic misconduct

Academic integrity means being honest in your studying and assessments. It is the basis for ethical decision-making and behaviour in an academic context. Academic integrity is informed by the values of honesty, trust, responsibility, fairness, respect and courage. Students are expected to be aware of, and act in accordance with, the University's Academic Integrity Policy.

Academic Misconduct, such as plagiarism or cheating, is a breach of Academic Integrity and is taken very seriously by the University. Types of misconduct include plagiarism, copying, unauthorised collaboration, taking unauthorised material into a test or exam, impersonation, and assisting someone else's misconduct. A more extensive list of the types of academic misconduct and associated processes and penalties is available in the University's Student Academic Misconduct Procedures.

It is your responsibility to be aware of and use acceptable academic practices when completing your assessments. To access the information in the Academic Integrity Policy and learn more, please visit the University's Academic Integrity website at www.otago.ac.nz/study/academicintegrity or ask at the Student Learning Centre or Library. If you have any questions, ask your lecturer.

Academic Integrity Policy (www.otago.ac.nz/administration/policies/otago116838.html)

Student Academic Misconduct Procedures

(<http://www.otago.ac.nz/administration/policies/otago116850.html>)

Course Instructors

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Centre for Sustainability

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Required text

Smith, K. (2013). *Environmental hazards: assessing risk and reducing disaster*. (6th edition), Routledge, 478pp.

Available at the University Bookshop for \$99.50 and from the publisher as an ebook. A copy of this book will also be held on close reserve in the Science Library.

Course resources

A number of useful resources are available on Blackboard (blackboard.otago.ac.nz) These resources include:

- Lecture outlines and notes (as pdf files)
- Links to lecture recordings (Echo360)
- Images that demonstrate particular geomorphic features
- Resources for the lab exercises Video recordings of natural hazards

Course structure

The lecture programme consists of 24 classes most of which have assigned readings from Smith, K. (2013). *Environmental hazards: assessing risk and reducing disaster*. Details of the readings will be given in the reading list and in individual lecture outlines. Depending on the lecturer, lecture delivery methods will vary. For some, pre-recorded lectures will be made available online prior to the normal timetabled lecture time. These lecturers may then make themselves available on zoom at the normal lecture time to answer questions. Others may give their lectures live at the normal timetabled lecture time, and upload the recording afterwards. The approach taken is up to the lecturer, and they will let you know. We will advise the zoom address for lecture delivery/lecture questions once we have one from AskOtago.

Day	Date	Lecturer	Lecture title / topic
Wed	2-Mar	ALL	Introduction
Fri	4-Mar	CO	Hazards & social science
Wed	9-Mar	CO	Social construction of hazards
Fri	11-Mar	SF	Conceptual frameworks for understanding hazards
Wed	16-Mar	SF	Extreme event statistics
Fri	18-Mar	CO	Risk, risk acceptance and risk avoidance
Wed	23-Mar	SF	Engineered approaches to hazard mitigation
Fri	25-Mar	CO	Societal responses to hazard mitigation

Wed	30-Mar	MS	Earthquake hazards 1
Fri	1-Apr	MS	Earthquake hazards 2
Wed	6-Apr	MS	Tsunami hazards 1
Fri	8-Apr	MS	Tsunami hazards 2
Wed	13-Apr	MS	Mass movement hazards
Fri	15-Apr	No Class	Good Friday
Wed	20-Apr	No Class	Mid Semester Break
Fri	22-Apr	No Class	Mid Semester Break
Wed	27-Apr	JW	Volcanic hazards 1
Fri	29-Apr	JW	Volcanic hazards 2
Wed	4-May	SF	Hydrological hazards: floods
Fri	6-May	SF	Hydrological hazards: droughts
Wed	11-May	SF	Severe storms 1
Fri	13-May	SF	Severe storms 2
Wed	18-May	SF	Environmental change 1
Fri	20-May	SF	Environmental change 2
Wed	25-May	SF/JW MS/CO	Case studies: Taieri flood events, Kaikoura earthquake
Fri	27-May		Revision session

How to pass this paper

Like first year study there is no mystery to successfully passing this paper. You simply need to be conscientious in your efforts and take responsibility for your own learning and progress. Experience teaching this course has suggested a few helpful tips:

- Attend all of the lectures, even when the weather starts to cool and the mornings get dark! It takes much more time and energy to catch up on a lecture than it does to attend.
- Take notes at lectures, even if the topic isn't interesting to you, because writing is a good way of reinforcing information. If you don't write it down you won't remember it (that works for us at least!).
- Powerpoint notes are designed as memory queues for the lecturer, and are not a substitute for taking notes. Consider the powerpoint notes as the skeleton of the lecture and your notes as the flesh to build onto this framework. All the powerpoint slides will be available on Blackboard before the lectures in order to facilitate their use as note skeletons. In addition, the classes will be recorded using Otago Capture (Echo360) and the recordings will be saved and linked to Blackboard.
- There is a strong correlation between missing course assessment and failure of these types of papers.
- The teaching team put a lot of effort into providing feedback on your written work. If you are concerned about your performance please consult the demonstrator who was responsible for marking your work, the Teaching Assistant or the lecturer responsible for lab exercise.

- If you are feeling inundated with work, don't despair, the teaching team in this paper are here to help you and in addition there are several support services in the University that can help you. Many of these problems can be sorted by good time management strategies, with which the Student Learning Centre or other support services may be of assistance (see below). Don't be shy to ask for help, and talk to the Teaching Assistant, who will be able to help you back onto the right track.
- All staff in this paper keep regular office hours, which you are welcome to use. If you are struggling with course assignments, your lab demonstrator is available to provide assistance during their office hours. If you are struggling with understanding the course content, first try reading the text book, and then follow-up with questions to the course lecturers.
- Don't be disheartened if your internal assessment grades are not what you expected. First, read over the comments and feedback and also make sure you read over the assessment criteria prior to submitting your work. Careful attention to these points will ensure your grades improve over the semester.

Laboratory Programme

Labs are timetabled for Monday afternoons 14:00-17:00, and Tuesday mornings 0900-1200. For two of the labs you will be doing a fieldtrip. At the time of preparation of this outline our plan is to run both Labs and fieldtrips in person, and the labs will be held in BURNS 1.

Please ensure that you wear masks and appropriate footwear for all labs and fieldtrips. No jandals, sandals or open-toed shoes.

Day	Date	Lecturer	Lecture title / topic
Mon pm	28 Feb		No lab
Tues am	1 Mar		“
Mon pm	7 Mar	CO	Social dimension of hazards
Tues am	8 Mar	CO	“
Mon pm	14 Mar	SF	Extreme event statistics
Tues am	15 Mar	SF	“
Mon pm	21 Mar	SF	Flood schemes (field trip)
Tues am	22 Mar	SF	“
Mon pm	28 Mar	MS	Earthquake hazards
Tues am	29 Mar	MS	“
Mon pm	4 Apr	MS	Tsunami hazards
Tues am	5 Apr	MS	“
Mon pm	11 Apr		No lab
Tues am	12 Apr		“
Mon pm	18 Apr		Mid Semester Break
Tues am	19 Apr		“
Mon pm	25 Apr	JW	Volcanic hazards

Tues am	26 Apr	JW	“
Mon pm	2 May	MS	Akatore Fault and Abbotsford landslide (field trip)
Tues am	3 May	MS	“
Mon pm	9 May	MS	Mass movements
Tues am	10 May	MS	“
Mon pm	23 May	ALL	Presentation of 365 assignments
Tues am	24 May	ALL	“

Please check the laboratory stream lists on Blackboard. If you want to change streams (permanently or for individual lab exercises) please contact the course Teaching Assistant.

There is an additional lab for Geol365 students only. The exercise is described in the lab exercise manual. This report is due on Friday May 27.

Disability Support

Both Departments encourage students to seek support if they are experiencing difficulty with their studies due to permanent, recurring or temporary impairment. Depending upon circumstances, students may contact, in confidence, their lecturers or paper coordinators to discuss adaptations in teaching and learning strategies and resources that may be helpful. The following contacts are relevant:

Marco Brenna (Geology Senior Lecturer)

marco.brenna@otago.ac.nz

Room GS09, Ground floor, Geology Building

Ben Varkalis (Geography Teaching Fellow)

479 9241

btv@geography.otago.ac.nz

Room 5.C.13 - 5th Floor, Richardson Building

Disability Information and Support

479 8235

disabilities@otago.ac.nz

<http://www.otago.ac.nz/disabilities>

University of Otago Student Learning Centre

The University runs a student learning centre that offers advice and support for learning activities. Details can be found on their website:

<http://www.otago.ac.nz/hedc/students/index.html>

OUSA Student Support

The Otago University Student Association (OUSA) run support groups, a peer support programme and offer an advocacy service. Details can be found on their website:
<https://www.ousa.org.nz/support>

References

Burton, I., Kates, R. W., & White, G. F. (1968.) The Human Ecology of Extreme Geophysical Events, *Natural Hazard Working Paper No. 1*.

Burton, I., Kates, R. W., & White, G. F. (1972). *The environment as hazard*. First Edition