ENVS237

Natural Hazards

S2 External 2016

Dept of Environmental Sciences

Contents

Disclaimer

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General Information

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Credit points
3

Prerequisites
18cp(P)

Corequisites

Co-badged status

Unit description
Everybody is at risk from natural hazards, either physically or economically, and as the global population grows, so too does the social and economic impact of natural disasters. Individual disasters in Australia have caused damage greater than $1.5 billion and globally individual disasters have caused damage greater than $150 billion. These disasters are a significant drain on our economy and cause enormous human suffering. However, some individuals, communities and societies are more at risk than others and experience greater losses following natural hazards. This unit examines the risk posed by natural perils through an understanding of the causes and impacts of the most significant natural hazards such as earthquakes, volcanoes, floods, tropical cyclones and tsunami, as well as 'megahazards' such as asteroid impacts with Earth. Specialists in natural hazards may pursue careers in the emergency services, disaster management, the insurance industry and hazards research.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

Recognise and understand the key processes by which natural hazards occur.

Use the literature, maps and charts to understand the spatial patterns of natural hazards.

Better understand the temporal pattern of natural hazards including return period.

Understand and explain critical pathways between natural and un-natural hazards, which create "hazard pairing".

Develop critical reading and thinking skills through regular reading and assessment tasks.

Develop written and verbal communication

General Assessment Information

Assignment submission, Turnitin and Plagiarism

This is a paperless unit, and no practicals will be physically handed in. You will submit all assignments through iLearn via a Turnitin link. Turnitin is an online program that detects plagiarised pieces of work. It compares not only work between students in the current year but also across previous years, across institutions, with all published materials, and the internet. It is an incredibly effective tool. Please write your work in your own words – in fact it is a requirement for all assignments in the course that they be written in your own words. Do not lend your work to other students - if that student plagiarises your work you too will be penalised. Do not copy and paste text into your document with the thought you will modify it later.

Plagiarism involves using the work of another person and presenting it as your own. Penalties

imposed by the University for plagiarism are serious and may include expulsion from the University. We are obliged to deal with any suggestion of plagiarism according to University policy. The University's policy on plagiarism is at www.mq.edu.au/policy/docs/academic_honesty/policy.html. This website includes a general discussion of plagiarism, definitions, examples of plagiarism, procedures that will be followed by the University in cases of plagiarism and recommended penalties. Students are expected that they will be familiar with the content of the website.

Extensions and penalties

10% of the practical value will be deducted for each day a practical is late, including each day of a weekend. If you are unable to submit the assignment by the due date then an extension must be sought before the due date unless this is absolutely impossible. To support your extension you will be asked to submit a Disruption to studies request via ask.mq.edu.au (see “If you miss...” below). All applications for extensions of deadlines must be submitted to the unit convener (damian.gore@mq.edu.au).

If you miss a practical submission *(note: attendance at practicals is not compulsory)*

Through:

Illness, misfortune, or special events

- Submit request for Disruption to Studies via ask.mq.edu.au (do not give doctor's certificates to your lecturer or tutors).
- You will need to provide documentation for illness. You cannot provide a medical certificate to ask.mq.edu – you must have the doctor complete a Professional Authority form (www.mq.edu.au/__data/assets/pdf_file/0009/183375/professional_authority_form_paf.pdf). If you do not submit this form with the request, the Disruption to Studies request will be declined by ask.mq.edu.au without ever being sent to the unit convener.
- For other situations you must provide a supporting letter explaining the circumstances that led to you missing the submission date/time (www.mq.edu.au/policy/docs/disruption_studies/schedule_evidence.html).
- The unit convener will process your Disruption to Studies request. If approved it is your responsibility to arrange with the unit convener (via email) to complete your practical at another time.

Neglect (i.e. forgot or just slack)

- Be honest! - there's no point in submitting the paperwork above.
- Contact the unit convener (via email) to plead your case.

Email Protocol

1. Be courteous i.e. address the intended reader appropriately and say thank you!
2. Spell our names correctly - we extend that courtesy to you; please do the same for us.
3. We endeavour to reply to emails in a timely fashion, but may only check and respond Monday to Friday, during working hours.

Assessment Tasks

Name	Weighting	Due
Practical 1	5%	Wk 2 - 14Aug16
Practical 2	5%	Wk 3 - 21Aug16
Practical 3	5%	Wk 4 - 28Aug16
Practical 4	5%	Wk 5 - 04Sep16
Practical 5	5%	Wk 6 - 11Sep16
Practical 6	5%	Wk 7 - 18Sep16
Practical 7	5%	Wk 8 - 09Oct16
Practical 8	5%	Wk 9 - 16Oct16
Practical 9	5%	Wk10 - 23Oct16
Practical 10	5%	Wk 11 - 30Oct16
Final examination	50%	TBA

Practical 1

Due: **Wk 2 - 14Aug16**
Weighting: **5%**

Earthquakes - detail on unit website.

On successful completion you will be able to:

- Recognise and understand the key processes by which natural hazards occur.
- Use the literature, maps and charts to understand the spatial patterns of natural hazards.
- Better understand the temporal pattern of natural hazards including return period.
- Understand and explain critical pathways between natural and un-natural hazards, which create "hazard pairing".
- Develop critical reading and thinking skills through regular reading and assessment

tasks.
- Develop written and verbal communication

Practical 2

Due: **Wk 3 - 21Aug16**
Weighting: **5%**

Volcanoes - detail on unit website.

On successful completion you will be able to:
- Recognise and understand the key processes by which natural hazards occur.
- Use the literature, maps and charts to understand the spatial patterns of natural hazards.
- Better understand the temporal pattern of natural hazards including return period.
- Develop critical reading and thinking skills through regular reading and assessment tasks.
- Develop written and verbal communication

Practical 3

Due: **Wk 4 - 28Aug16**
Weighting: **5%**

Mass movements - detail on unit website.

On successful completion you will be able to:
- Recognise and understand the key processes by which natural hazards occur.
- Use the literature, maps and charts to understand the spatial patterns of natural hazards.
- Better understand the temporal pattern of natural hazards including return period.
- Develop critical reading and thinking skills through regular reading and assessment tasks.
- Develop written and verbal communication

Practical 4

Due: **Wk 5 - 04Sep16**
Weighting: **5%**

Floods - detail on unit website.

On successful completion you will be able to:
- Recognise and understand the key processes by which natural hazards occur.
- Use the literature, maps and charts to understand the spatial patterns of natural hazards.

- Better understand the temporal pattern of natural hazards including return period.
- Understand and explain critical pathways between natural and un-natural hazards, which create "hazard pairing".
- Develop critical reading and thinking skills through regular reading and assessment tasks.
- Develop written and verbal communication

Practical 5

Due: **Wk 6 - 11Sep16**
Weighting: **5%**

Tropical cyclones - detail on unit website.

On successful completion you will be able to:

- Recognise and understand the key processes by which natural hazards occur.
- Use the literature, maps and charts to understand the spatial patterns of natural hazards.
- Better understand the temporal pattern of natural hazards including return period.
- Understand and explain critical pathways between natural and un-natural hazards, which create "hazard pairing".
- Develop critical reading and thinking skills through regular reading and assessment tasks.
- Develop written and verbal communication

Practical 6

Due: **Wk 7 - 18Sep16**
Weighting: **5%**

Tsunami - detail on unit website.

On successful completion you will be able to:

- Recognise and understand the key processes by which natural hazards occur.
- Use the literature, maps and charts to understand the spatial patterns of natural hazards.
- Better understand the temporal pattern of natural hazards including return period.
- Develop critical reading and thinking skills through regular reading and assessment tasks.
- Develop written and verbal communication

Practical 7

Due: **Wk 8 - 09Oct16**

Weighting: **5%**

ENSO - detail on unit website.

On successful completion you will be able to:

- Recognise and understand the key processes by which natural hazards occur.
- Use the literature, maps and charts to understand the spatial patterns of natural hazards.
- Better understand the temporal pattern of natural hazards including return period.
- Develop critical reading and thinking skills through regular reading and assessment tasks.
- Develop written and verbal communication

Practical 8

Due: **Wk 9 - 16Oct16**
Weighting: **5%**

Heatwaves - detail on unit website.

On successful completion you will be able to:

- Recognise and understand the key processes by which natural hazards occur.
- Use the literature, maps and charts to understand the spatial patterns of natural hazards.
- Better understand the temporal pattern of natural hazards including return period.
- Develop critical reading and thinking skills through regular reading and assessment tasks.
- Develop written and verbal communication

Practical 9

Due: **Wk10 - 23Oct16**
Weighting: **5%**

Bushfire - detail on unit website.

On successful completion you will be able to:

- Recognise and understand the key processes by which natural hazards occur.
- Use the literature, maps and charts to understand the spatial patterns of natural hazards.
- Better understand the temporal pattern of natural hazards including return period.
- Understand and explain critical pathways between natural and un-natural hazards, which create "hazard pairing".
- Develop critical reading and thinking skills through regular reading and assessment tasks.

- Develop written and verbal communication

Practical 10

Due: **Wk 11 - 30Oct16**
Weighting: **5%**

Social aspects - detail on unit website.

On successful completion you will be able to:

- Use the literature, maps and charts to understand the spatial patterns of natural hazards.
- Better understand the temporal pattern of natural hazards including return period.
- Develop critical reading and thinking skills through regular reading and assessment tasks.
- Develop written and verbal communication

Final examination

Due: **TBA**
Weighting: **50%**

Final examination - at a time and place to be set by the University later in the session.

On successful completion you will be able to:

- Recognise and understand the key processes by which natural hazards occur.
- Better understand the temporal pattern of natural hazards including return period.
- Understand and explain critical pathways between natural and un-natural hazards, which create "hazard pairing".
- Develop written and verbal communication

Delivery and Resources

Classes - This unit is taught via lectures, workshops (practicals), readings and assessment tasks. Students should use iLearn to access teaching and learning materials, to stay in touch with the unit, to contact the lecturer and tutors, and to discuss issues and concepts with classmates.

Recommended Texts - There is no prescribed text for ENVS237. We remember what it's like to be a poor student, so we may refer to an electronic text that we have placed on the unit website for your convenience.

Workload - Workload for units at Macquarie University is based on a minimum of 3 hours per credit point per week to receive a Pass grade (e.g. www.mq.edu.au/study/other-study-options/professional-development-and-general-interest/non-award-study/planning-your-studies). This requires planning on your part to do all the work required in lectures, attending workshops/

practicals, completing practical assessment tasks, reading and study for the final exam. For ENVS237 this means you are expected to work at least 9 hours per week on this unit to receive a Pass grade. Obviously this is dependent on the speed at which you learn and your ability to study effectively. You will find you need to spend extra time on different parts of the course content. Depending on when assignments are due, this workload will be spread over the session. It is critical that you manage your time effectively and work progressively towards assignment submissions well in advance. A guide of hours required to receive a Pass grade is outlined below. However, keep in mind, grades are awarded on a demonstration of understanding and ability not on effort!

Activity	Hours per activity	# of activities	Hours per session
Lectures	1	25	25
Practicals	2	10	20
Assignments	3	10	30
Readings			30
Exam			30
Total for session			**125**
Per week (15 weeks)			**9**

Assessment criteria

- Answering the question that is asked with a well-developed discussion of the topic, and its implications, that places the topic in a broader context.
- Appropriate use and citation of a wide range of relevant literature, including texts, research papers, and grey literature.
- Demonstrating good planning with a clear structure, headings, and a logical argument based firmly on the literature cited.
- Presenting a legible paper with correct grammar and spelling, and correct use of professional terminology as appropriate. Your submissions must not be hand written.
- Using correct SI units and correct abbreviations.
- Referring to figures and tables in the text if required, with full and appropriate titles on each figure and table, irrelevant material omitted, sources given.
- Citing references acceptably if required, correctly and consistently in the text as well as in the reference list, no abbreviations, correct citation of chapters in edited books.

- Staying within the word limit.

If you experience difficulty achieving a good standard in your written presentation, please talk to us. The University offers a variety of remedial writing courses and sources of advice that may help you. We emphasise the necessity for clear writing and its importance in your performance assessment.

Assessment of assignments will be based on the Macquarie University scale High Distinction (HD), Distinction (D), Credit (Cr), Pass (P) and Fail (Fail). The markers may choose to further refine these grades by use of a "+" or "-" to indicate work towards the top or the bottom of each grade's band of marks. Feedback will also come in the form of comments written on each student's assignments or emailed directly to you, as well as general commentaries directed to the entire class after all marked assignments have been returned (typically in class or via an email list).

In ENVS237 we expect quality in your assignments and a level of knowledge and comprehension of course content that demonstrates what you have learnt throughout your degree and which sets the foundations for a career in this field. Grades for the unit as a whole will be awarded according to the following general criteria (course rubric).

	Developing	Functional	Proficient	Advanced
Level of attainment	Has not yet reached the desired standard. Limited understanding of required concepts and knowledge. Numerical responses incorrect or no working shown. A **fail** grade would be given.	Has reached basic academic standards. Work has limited translation of concepts and procedures to new contexts unless aided. Numerical responses may be correct and some working is shown. A **pass** grade would be awarded.	Has completely reached the standards expected. Can work independently in new contexts, adapting procedures to meet the context. Demonstrates awareness of own limitations. Numerical answers correct and working shown. A **credit** grade would be awarded.	Has gone beyond the expected standards. Exhibits high levels of independence and can use concepts to generate new ways of completing procedures. Can engage in productive critical reflection. Numerical answers correct and full working shown. A grade of **distinction** or **high distinction** would be awarded.

iLearn - The primary means of communication for this unit is via iLearn and email. iLearn is a web-based computer-mediated communication package and can be accessed by most web browsers from inside or outside the University.

We expect you to use iLearn for;

- Checking subject announcements regularly (at least twice per week)
- Discussing the unit and its content with staff and other students
- Downloading Lectures (as audio files through Echo360, and as downloadable PDF presentations) and Practical materials. Echo360 - A guide for accessing lecture recordings through the Echo360 EchoCenter page in iLearn is at mq.edu.au/iLearn/

student_info/lecture_recordings.htm

- Downloading reference materials.

Technologies used and required - Access to and competency with browser-based software. Use of Excel or a similar spreadsheet program is strongly recommended.

Logging in to iLearn - The URL for the iLearn login page is: https://ilearn.mq.edu.au/ You will need to log in to iLearn each time you use it. Your user name is your student number. If you are having trouble accessing your online unit due to a disability or health condition, please visit the Student Services Website http://students.mq.edu.au/support/health_and_wellbeing/ for information on how to get assistance. If you have problems logging on after ensuring you have entered your username and password correctly, you should contact OneHelp, www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

Got a question?

1. Read the unit outline.
2. Consult iLearn (the question may have already been asked).
3. All questions on lecture content should be posted on the iLearn forum. We monitor the iLearn forum and will ensure all questions are answered correctly. If the answer to any unit-related question will benefit others, please post it on iLearn.
4. Tutors: For questions about practical content. If you can ask questions throughout practical sessions, please do so as that way you will get a timely answer. ***Externals*** - please feel free to email us at any time - you also have access to teaching staff.
5. Unit convenor: questions about lecture content, organising alternative times for assessments or extensions, withdrawal and personal matters.
6. Unexpected changes made during the unit will announced via the website so make sure you check iLearn regularly.

Workload requirements and unit rubric

Unit Schedule

The unit is taught via lectures, workshops, readings and assessment tasks. Class times and locations are at https://timetables.mq.edu.au/

Week 1. ***Lecture 1***: Introduction and overview. ***Lecture 2***: Earthquakes. ***Practical***: None.

Week 2. ***Lecture 3***: Volcanoes. ***Lecture 4***: Mass movements. ***Practical 1***: Earthquakes.

Week 3: ***Lecture 5***: Floods. ***Lecture 6***: Severe storms. ***Practical 2***: Volcanoes.

Week 4: ***Lecture 7***: Lightning. ***Lecture 8***: Hail. ***Practical 3***: Mass movements.

Week 5: ***Lecture 9***: Tornados. ***Lecture 10***: Tropical cyclones. ***Practical 4***: Floods.

Week 6: ***Lecture 11***: Tsunami. ***Lecture 12***: Coastal & Oceanic. ***Practical 5***: Tropical cyclones.

Week 7: ***Lecture 13***: ENSO & Drought. ***Lecture 14***: Heatwaves. ***Practical 6***: Tsunami.

Week 8: ***Lecture 15***: Bushfire. ***Lecture 16***: Biohazards. ***Practical 7***: ENSO.

Week 9: ***Lecture 17***: Environmental pollution. ***Lecture 18***: Technological hazards. ***Practical 8***: Heatwaves.

Week 10: ***Lecture 19***: Global change & loss. ***Lecture 20***: Risk assessment. ***Practical 9***: Bushfire.

Week 11: ***Lecture 21***: Vulnerability & disasters. ***Lecture 22***: Emergency management. ***Practical 10***: Social aspects.

Week 12: ***Lecture 23***: Megaperils. ***Lecture 24***: Perils in Australia. ***Practical***: None.

Week 13: ***Lecture 25***: Revision. ***Lecture***: None. ***Practical***: None.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central. Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

New Assessment Policy in effect from Session 2 2016 http://mq.edu.au/policy/docs/assessment/policy_2016.html. For more information visit http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/

Assessment Policy prior to Session 2 2016 http://mq.edu.au/policy/docs/assessment/policy.html

Grading Policy prior to Session 2 2016 http://mq.edu.au/policy/docs/grading/policy.html

Grade Appeal Policy http://mq.edu.au/policy/docs/gradeappeal/policy.html

Complaint Management Procedure for Students and Members of the Public http://www.mq.edu.au/policy/docs/complaint_management/procedure.html

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/policy.html *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the Learning and Teaching Category of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of

Conduct: https://students.mq.edu.au/support/student_conduct/

Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au.

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- Workshops
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

Student Services and Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Learning outcomes

- Better understand the temporal pattern of natural hazards including return period.
- Understand and explain critical pathways between natural and un-natural hazards, which create "hazard pairing".
- Develop critical reading and thinking skills through regular reading and assessment tasks.
- Develop written and verbal communication

Assessment tasks

- Practical 1
- Practical 2
- Practical 3
- Practical 4
- Practical 5
- Practical 6
- Practical 7
- Practical 8
- Practical 9
- Practical 10
- Final examination

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcomes

- Recognise and understand the key processes by which natural hazards occur.
- Use the literature, maps and charts to understand the spatial patterns of natural hazards.
- Better understand the temporal pattern of natural hazards including return period.
- Understand and explain critical pathways between natural and un-natural hazards, which create "hazard pairing".
- Develop written and verbal communication

Assessment tasks

- Practical 1
- Practical 2
- Practical 3
- Practical 4
- Practical 5
- Practical 6
- Practical 7
- Practical 8
- Practical 9
- Practical 10
- Final examination

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

Learning outcomes

- Recognise and understand the key processes by which natural hazards occur.
- Use the literature, maps and charts to understand the spatial patterns of natural hazards.
- Better understand the temporal pattern of natural hazards including return period.
- Understand and explain critical pathways between natural and un-natural hazards, which create "hazard pairing".
- Develop critical reading and thinking skills through regular reading and assessment tasks.
- Develop written and verbal communication

Assessment tasks

- Practical 1
- Practical 2
- Practical 3
- Practical 4
- Practical 5

- Practical 6
- Practical 7
- Practical 8
- Practical 9
- Practical 10

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Recognise and understand the key processes by which natural hazards occur.
- Use the literature, maps and charts to understand the spatial patterns of natural hazards.
- Better understand the temporal pattern of natural hazards including return period.
- Understand and explain critical pathways between natural and un-natural hazards, which create "hazard pairing".

Assessment tasks

- Practical 1
- Practical 2
- Practical 3
- Practical 4
- Practical 5
- Practical 6
- Practical 7
- Practical 8
- Practical 9
- Practical 10
- Final examination

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to

critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- Recognise and understand the key processes by which natural hazards occur.
- Use the literature, maps and charts to understand the spatial patterns of natural hazards.
- Better understand the temporal pattern of natural hazards including return period.
- Understand and explain critical pathways between natural and un-natural hazards, which create "hazard pairing".

Assessment tasks

- Practical 1
- Practical 2
- Practical 3
- Practical 4
- Practical 5
- Practical 6
- Practical 7
- Practical 8
- Practical 9
- Practical 10
- Final examination

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Use the literature, maps and charts to understand the spatial patterns of natural hazards.
- Better understand the temporal pattern of natural hazards including return period.
- Understand and explain critical pathways between natural and un-natural hazards, which create "hazard pairing".

Assessment tasks

- Practical 1
- Practical 2
- Practical 3
- Practical 4
- Practical 5
- Practical 6
- Practical 7
- Practical 8
- Practical 9
- Practical 10
- Final examination

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

- Develop critical reading and thinking skills through regular reading and assessment tasks.
- Develop written and verbal communication

Assessment tasks

- Practical 1
- Practical 2
- Practical 3
- Practical 4
- Practical 5
- Practical 6
- Practical 7
- Practical 8
- Practical 9
- Practical 10

- Final examination

Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

Learning outcomes

- Recognise and understand the key processes by which natural hazards occur.
- Understand and explain critical pathways between natural and un-natural hazards, which create "hazard pairing".

Assessment tasks

- Practical 1
- Practical 2
- Practical 3
- Practical 4
- Practical 5
- Practical 6
- Practical 7
- Practical 8
- Practical 9
- Practical 10
- Final examination

Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

Learning outcomes

- Recognise and understand the key processes by which natural hazards occur.
- Better understand the temporal pattern of natural hazards including return period.

- Understand and explain critical pathways between natural and un-natural hazards, which create "hazard pairing".

Assessment tasks

- Practical 1
- Practical 2
- Practical 3
- Practical 4
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- Practical 7
- Practical 8
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- Practical 10
- Final examination