UNSW SYDNEY

Course Outline

GEOS1111

Fundamentals of Geology

School of Biological, Earth and Environmental Sciences

Faculty of Science

Term 3, 2020

1 Staff

FAQ. *What do I call the teachers?* In this course, all staff prefer to be called by their first name.

Position	Name		Email (@unsw.edu.au)	Consultation times and locations	Contact Details
Convenor	ME	Dr Malte Ebach	m.ebach	By appointment	Email
Lecturer	MVK	Prof Martin Van Kranendonk	m.vankranendonk	By appointment	Email
Lecturer	DRC	A/Prof David Cohen	d.cohen	By appointment	Email
Lecturer	IG	Dr Ian Graham	i.graham	By appointment	Email
Lecturer	BK	A/Prof Bryce Kelly	bryce.kelley	By appointment	Email
Lecturer	JT	A/Prof John Triantafilis	j.triantafilis	By appointment	Email
Lecturer	SC	Dr Stuart Clark	stuart.clark	By appointment	Email

Dr Malte Ebach

A/Prof John Triantafilis

Dr Stuart Clark

Prof Martin Van Kranendonk

Prof David Cohen

A/Prof Bryce Kelley

Dr Ian Graham

2 Course information

Units of credit: 6

Pre-requisite(s): None (first-year course), but any high school science course will help, particularly Earth & Environmental Science.

Teaching times and locations (**check Moodle**):

Lecture 1	Online	Pre-recorded
Lecture 2	Online	Pre-recorded
Lecture 3	Online	Pre-recorded
Lab	Online	Tuesday and Wednesday 10am-1pm
Tutorial	Online	Pre-recorded

http://timetable.unsw.edu.au/2020/GEOS1111.html

Lab Equipment Needed

Hand lens, magnet and pocket knife: Students in first year geology should have purchased one 10x hand lens before Week 2. You will also need a small pocket knife to test the hardness of rocks [however note that you are only allowed to carry the pocket knife when you are going to the lab] and a magnet to test the magnetic properties of minerals and rocks. They are available for purchase from the Pharmacy Shop G039, Quadrangle Building (Map Reference E15, Phone 9385 7617).

Mapping gear: Mapping equipment including a ruler, pencil, coloured pencils, calculator, protractor and eraser are required to complete the various mapping exercises.

2.1 Course summary

This course provides a sound basis in geology to those wishing to pursue professional careers as geologists, mining and petroleum engineers and environmental Earth scientists. It will also be of interest to those who wish to understand more about the nature and origin of Earth materials. The fundamental properties of minerals and rocks and the processes by which they form are described. Geological history and structure and consequences for the formation and preservation of minerals and coal resources are considered. Methods for the analysis, description and definition of geological materials and resources are provided.

2.2 Course aims

This course aims to provide the basic foundations of geology. It provides an introduction to minerals and rocks through online investigation both in the laboratory and the field. The course enables participants to interpret geological maps including visualising the three-dimensional form of folded and/or faulted rock sequences. It aims to encourage participants to be more observant of the landscape around them in terms of the underlying geology. The course introduces some classes of ore deposits and provides online investigation of economic minerals. The course aims to introduce exploration methods and the relationship between mining and the environment.

This course provides you with fundamental knowledge essential for earth science and other geology related majors. It is complementary with GEOS1701, and GEOS1211

GEOS1111 prepares students for GEOS2721, GEOS2711, GEOS2181, GEOS2291, and GEOS2131. (It is a core compulsory course in the Earth Science majors and the Environmental Management program).

2.3 Course learning outcomes (CLO)

At the successful completion of this course you (the student) should be able to:

1. Describe, classify and identify common rock-forming minerals, and igneous, sedimentary and metamorphic rocks, both theoretically and in hand-specimen.
2. Construct basic geological cross-sections and maps and interpret common geological structures from these.
3. Describe the main processes forming common ore deposits, their tectonic setting and their mineralogy, including and the economics driving mineral exploration.
4. Observe and describe geological features (common structures and rock types) of different landscapes and interpret changes over time and tectonic context.
5. Integrate geoscience knowledge into your view of the world and assess competing claims regarding the geosciences within the media.

2.4 Relationship between course and program learning outcomes and assessments

Science program learning outcomes:

1. Develop and sustain an interest in and knowledge of Science.
2. Develop a working knowledge of scientific methods of investigation.
3. Encourage curiosity and creative imagination and an appreciation of the role of speculation in the selection and solution of problems, the construction of hypotheses, and the design of experiments.
4. Develop an appreciation of scientific criteria and a concern for objectivity and precision.
5. Develop confidence and skill in formulating problems and in treating both qualitative and quantitative data.
6. Develop the ability and disposition to think logically, to communicate clearly by written and oral means, and to read critically and with understanding.
7. Develop the habit of seeking and recognising relationships between phenomena, principles, theories, conceptual frameworks and problems.
8. Promote understanding of the significance of science, technology, economics and social factors in modern society, and of the contributions they can make in improving material conditions.
9. Provide opportunities for the development of students' motivations and social maturity, and an awareness of their capabilities in relation to a choice of career which will be fruitful to themselves and to society.
10. Provide opportunity to study science in combination with other disciplines

Course Learning Outcome (CLO)	LO Statement	Program Learning Outcome (PLO)										Related Tasks & Assessment
		1	2	3	4	5	6	7	8	9	10	
CLO 1	Describe, classify and identify common rock-forming minerals, and igneous, sedimentary and metamorphic rocks, both theoretically and in hand-specimen.											Mineral and rocks lectures and labs. Labs include group work and problem solving. Practical lab test.
CLO 2	Construct basic geological cross-sections and maps and interpret common geological structures from these.											Structural geology and mapping lectures and labs. Labs include group work and problem solving.
CLO 3	Describe the main processes forming common ore deposits, their tectonic setting and their mineralogy, including and the economics driving mineral exploration.											Economic geology lectures. Economic minerals labs.
CLO 4	Observe and describe geological features (common structures and rock types) of different landscapes and interpret changes over time and tectonic context.											Structural geology and mapping lectures.
CLO 5	Understand tectonics, mantle convection and mantle processes											Tectonics & mantle convection lectures and labs.
CLO 6	Integrate geoscience knowledge into your view of the world and assess competing claims regarding the geosciences within the media.											All lectures and labs are designed to improved critical analysis of geology related issues.

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3 Strategies and approaches to learning

3.1 Learning and teaching activities

This course utilises lectures, laboratory practicals and online exercises. These different learning activities are directly linked with each other.

The lectures are designed to explain and understand the basic elements of geology and give a background to the practical exercises. Most of the course practical component involves working in teams to characterise minerals, rocks and understand geological maps. There is emphasis on visualising rocks in three dimensions.

3.2 Expectations of students

An integral part of this course is engagement in class activities as well as the online component. You may fail the course if you do not attend regularly, even if you complete all assignments. You must attend 80% of laboratory classes, lectures are not compulsory but highly valuable and provide an opportunity to question your teachers. You must actively participate in classes and online discussions and complete all set work to a satisfactory standard as discussed in class and in the assignment descriptions. The one-day fieldtrip is compulsory.

From the university guidelines (https://student.unsw.edu.au/uoc): “The normal workload expectations of a student are approximately 25 hours per term for each UOC, including class contact hours, other learning activities, preparation and time spent on all assessable work.”

4 Course schedule and structure

This course consists of 6 hours of class contact hours weekly. You are expected to take an additional 5 hours of non-class contact hours to complete assessments, readings and exam preparation.

See timetable on Moodle and below for a detailed schedule.

5 Assessment

Assessment task	Length	Weight	Mark	Assessment criteria	Due date	Feedback*
Assessment 1: Mineral and Rock hand specimen tests	1 hour in-class practical tests: Mineral and Rock Test Economic minerals Test	 10% 10%	 28 32	Multiple choice test. Identification of the diagnostic properties of minerals and ability to accurately describe the properties of selected rocks.	Online	Group feedback given in lecture time, and individual feedback given via Moodle Gradebook.
Assessment 2: Mantle convection Lab Tectonics Lab	Short exercises/quiz: Mantle Convection Lab Tectonics Lab	 10% 10%	100	Short exercises/quiz. Understanding Earth mantle convection processes and tectonics	During lab time	Group feedback given in lecture time, and individual feedback given via Moodle Gradebook.
Assessment 3: Mapping Test	1 hour in-class test	20%	22	Multiple choice test. Understanding of structure contours and describing and quantifying geological structures.	Online	Group feedback given in lecture time, and individual feedback given via Moodle Gradebook.
Final Exam	2 hour final exam	40%	100	Understanding of key geological concepts through both multiple-choice questions (40% of exam) (about each lecture) and short answer questions (60% of exam).	In official exam period.	

** Please organise a time to meet with the course convenor if you would like additional feedback.*

Further information: UNSW grading system: https://student.unsw.edu.au/grades; UNSW assessment policy: https://student.unsw.edu.au/assessment

5.1 Submission of assessment tasks / special consideration

In this course, the Fieldtrip Worksheet is the only written report, and this is handed in on the day of your fieldtrip. The remaining assessments are laboratory practical tests.

If you experience sickness, misadventure or other circumstances beyond your control that may impact your ability to complete/attend compulsory classes/fieldtrip/tests, you should request special consideration through https://student.unsw.edu.au/special-consideration. Please also e-mail the course convenor, as soon as possible. The School of BEES also has certified Mental Health First Aiders who can help in an emergency or help with accessing other university or external supports. and can help provide information regarding supports provided by the university and externally. *http://www.bees.unsw.edu.au/flourish-mentally*

Requests should be made at the latest, within three days of any test or assessment, or one week after the final theory exam. Please provide a copy of your medical certificate or other documentation supporting your misadventure as soon as convenient.

An alternative test will be arranged at a mutually convenient time.

Assignments submitted after the due date will be penalised at the rate of 10% per day, unless accompanied by a medical certificate. All outstanding assignments must be handed in by the end of Week 10. Work will only be accepted after this date if accompanied by a medical certificate.

Academic misconduct will not be tolerated in any form in this course and particular attention is drawn to the information about plagiarism included in the following section.

6 Academic integrity, referencing and plagiarism

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

The preferred referencing style for this course is the APA 6th edition formal. Details can be found here: http://www.tandf.co.uk/journals/authors/style/reference/tf_APA.pdf

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.[1] 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 and **plagiarism** can be located at:

- The *Current Students* site https://student.unsw.edu.au/plagiarism**,** and
- The *ELISE* training site http://subjectguides.library.unsw.edu.au/elise/presenting

The *Conduct and Integrity Unit* provides further resources to assist you to understand your conduct obligations as a student: https://student.unsw.edu.au/conduct.

What is Plagiarism? †

Plagiarism is the presentation of the thoughts or work of another as one's own. Examples include:

- Direct duplication of the thoughts or work of another, including by copying material, ideas or concepts from a book, article, report or other written document (whether published or unpublished), composition, artwork, design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person's assignment without appropriate acknowledgement;
- Paraphrasing another person's work with very minor changes keeping the meaning, form and/or progression of ideas of the original;
- Piecing together sections of the work of others into a new whole;
- Presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor;
- Claiming credit for a proportion a work contributed to a group assessment item that is greater than that actually contributed.
- For the purposes of this policy, submitting an assessment item that has already been submitted for academic credit elsewhere may be considered plagiarism;
- Knowingly permitting your work to be copied by another student may also be considered to be plagiarism; and
- An assessment item produced in oral, not written, form, or involving live presentation, may similarly contain plagiarised material.

The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does not amount to plagiarism.

†Based on that proposed to the University of Newcastle by the St James Ethics Centre. Used with kind permission from the University of Newcastle and adapted with kind permission from the University of Melbourne

[1] International Center for Academic Integrity, 'The Fundamental Values of Academic Integrity', T. Fishman (ed), Clemson University, 2013.

7 Readings and resources

The following table lists textbooks that may be of interest; however, these are NOT PRESCRIBED. The bolded texts are recommended. The course Moodle site details links to resources that are freely accessible for UNSW students and relevant to each topic.

Search the library here: https://www.library.unsw.edu.au/

	Author/Title	Latest Edition	UNSW library hard copy	UNSW library ebook
General	Allaby, A., & Allaby, M. (2008). A dictionary of earth sciences. Oxford University Press.	3rd	No	Yes
	Allaby, M. (Ed.). (2013). A dictionary of geology and earth sciences. Oxford University Press.	4th	No	Yes
Fundamentals of Geology	**Marshak, S. (2015). Earth Portrait of a Planet.+Geotours Workbook Norton**	6th	5th ed. print	No
	Marshak, S. (2016). Essentials of Geology. W.W. Norton and Company, NY	5th	5th ed. print	No
	Lutgens, K. and Tarbuck, E.J. (2018). Essentials of Geology. Prentice Hall.	13th	12th ed. print	No
	Skinner, B.J., Porter, S.C. (2000). The Dynamic Earth. John Wiley and Sons.	5th	5th ed. print	No
	Stanley, S. M. (2015). Earth system history. Macmillan.	4th	2nd ed. print	No
	Tarbuck, E.J., Lutgens, K. (2016) Earth: An Introduction to Physical Geology. International Edition. Prentice Hall.	12th	9th ed. print	No
	Fletcher, C. (2014) Physical Geology – The Science of Earth. Wiley	2nd	2nd ed. print	Yes
	Smith, G. & Pun, A. (2014) How Does Earth Work? Physical Geology and the Process of Science. Pearson.	2nd	2nd ed. print	No

	Author/Title	Latest Edition	UNSW library hard copy	UNSW library ebook
	Monroe, J.S. & Wicander, R. (2015) The Changing Earth, Exploring Geology and Evolution. Cengage Learning.	7th	7th print	No
Economic geology	Evans, A.M. (1993) Ore Geology and Industrial Minerals, An Introduction. Blackwell Scientific Publication – for use in GEOS1111 and GEOS3141.	3rd	3rd print	Yes
	Ridley, J., (2013) Ore deposit geology. Cambridge University Press			
	The geology and origin of Australia's mineral deposits			
Australian specific	Johnson, D.(2016) The Geology of Australia.., Cambridge	3rd	3rd print	Yes
	Blewett, R. (2012) Shaping a nation: A geology of Australia. Geoscience Australia and ANU E-Press. | Free PDFs: http://press.anu.edu.au/publications/shaping-nation/download	2012	2012	PDFs available
	Clark, I.F. & Cook, B.J. (1983) Perspectives of the Earth, Australian Academy of Science – lots of Australian examples but out of print.	1983	1983	No
Mineralogy & Petrology	Mason, John. (2015). Introducing Mineralogy. Dunedin Academic Press.	2015	2015	Yes
	Read, H. H. (1976) Rutley's Elements of Mineralogy, Allen and Unwin. – available in the library or second hand bookshops. There are many editions of this useful text.	27th	27th print	Yes
	Klein, C. (2017) Earth Materials: Introduction to Mineralogy and Petrology. Cambridge University Press	2nd	1st print	No
	Klein, C. (2008) The 23rd edition of the manual of mineral science (after James D. Dana) Wiley	23rd	23rd print	No

8 Administrative matters

8.1 School of BEES Student Office

Please contact the Nucleus Student Hub: https://nucleus.unsw.edu.au/en/contact-us

8.2 Equity and diversity policy

Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course convenor prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equity and Diversity Unit (9385 4734 or https://student.unsw.edu.au/disability).

Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made (https://student.unsw.edu.au/disability).

The School of Biological, Earth and Environmental Sciences aims to provide a safe, supportive and welcoming environment for all staff and students regardless of their race, sex, age, religion, disability, sexual orientation or gender identification. As such, the School strongly supports UNSW's Equity and Diversity Policy in regard to these matters. http://www.bees.unsw.edu.au/equity

Definitions, policies and reporting portals can be found here: https://student.unsw.edu.au/equity

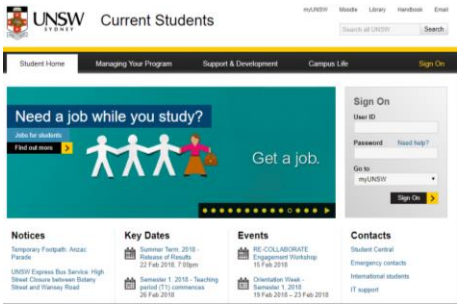
8.3 Grievance policy

In all cases you should first try to resolve any issues with the course convenor. If this is unsatisfactory, you should contact the School Student Ethics Officer (A/Prof Stephen Bonser, s.bonser@unsw.edu.au) or the School's Grievance Officer / Designated Officer under the UNSW Plagiarism Procedure. (A/Prof Scott Mooney s.mooney@unsw.edu.au). UNSW has formal policies about the resolution of grievances that can be reviewed in myUNSW A to Z Guide (see https://student.unsw.edu.au/complaints).

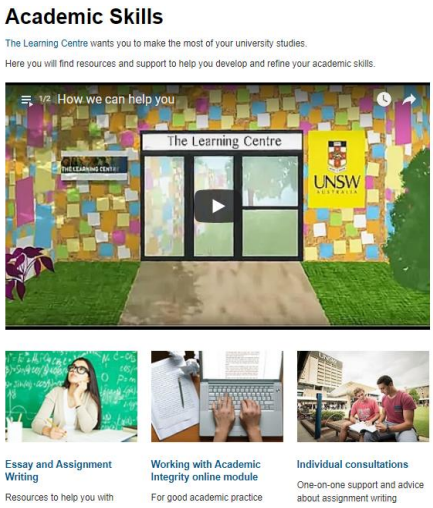
Designated/Grievance Officer	**School Student Ethics Officer**	**University Contact**
A/Prof Scott Mooney	A/Prof Stephen Bonser	University Counselling Services
School of BEES	School of BEES	Tel: 9385 5418
s.mooney@unsw.edu.au	s.bonser@unsw.edu.au	
Tel: 9385 8036	Tel: 9385 3863	

9 Additional support for student

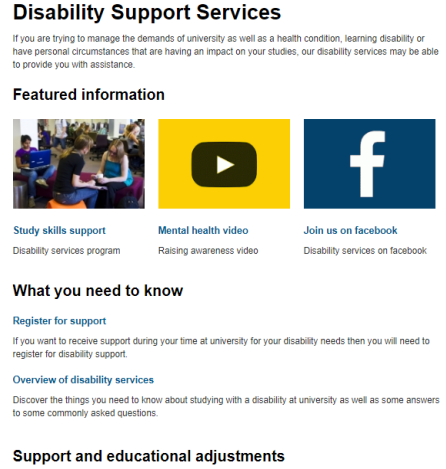
The Current Students Gateway:
https://student.unsw.edu.au/



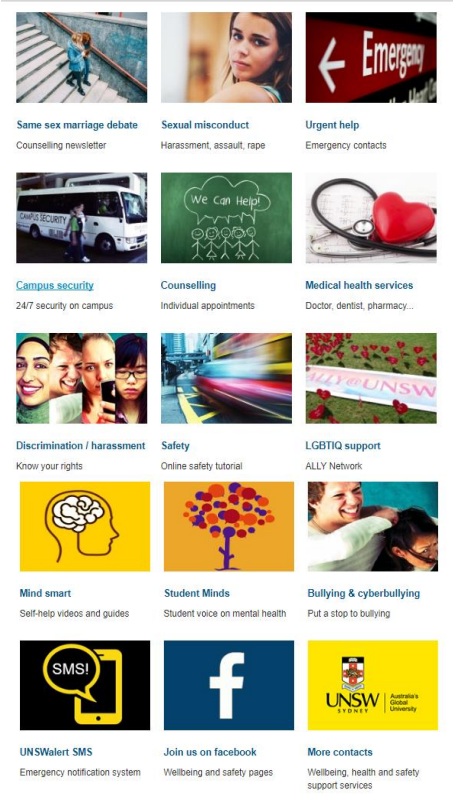
Academic Skills and Support:
https://student.unsw.edu.au/academic-skills



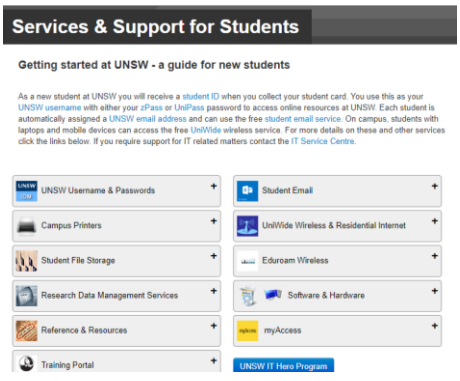
Disability Support Services:
https://student.unsw.edu.au/disability-services



Student Wellbeing, Health and Safety:
https://student.unsw.edu.au/wellbeing



UNSW IT Service Centre:
www.it.unsw.edu.au/students/index.html



10 Student Conduct and Health & Safety

10.1 Respectful behaviour

You have a right to feel safe, respected and welcome to fully participate in university life. This also means that you have an obligation to ensure that your behaviour does not infringe on the enjoyment of these rights for other students or staff. Behaviour that negatively impacts on others, or is unlawful, can constitute misconduct.

Definitions, policies and reporting portals can be found at these sites:

https://student.unsw.edu.au/equity https://student.unsw.edu.au/harassment
http://subjectguides.library.unsw.edu.au/elise/respect

Fieldtrips are academic activities, which are fun and are a great way to get to know your classmates. Students and staff are committed to providing a friendly and safe environment for all. To achieve this, participants must follow the following:

- Treat all other field participants and members of the public with courtesy and respect.
- Adopt a responsible attitude whilst on the fieldtrip
- Do not perform duties or functions for the University under the influence of alcohol or drugs
- Comply with instructions and directions issued by fieldtrip supervisors
- Take action to avoid, eliminate or minimize risks

Additionally, behaviour on course fieldtrips must be consistent with the Student Code of Conduct. There are five primary student responsibilities under this Code:

- A condition of enrolment that students inform themselves of the University's rules and policies affecting them
- An obligation to act with integrity in academic work, to ensure that all academic work is conducted ethically and safely
- An obligation to observe standards of equity and respect in dealing with every member of the University community
- An obligation to use and care for University resources in a lawful and appropriate manner
- An obligation to not diminish the University's reputation in the carrying out of academic and other associated University activities.

UNSW is within its right to terminate participation in a fieldwork activity and may institute academic misconduct proceedings in circumstances where a student wilfully fails to work in a safe manner or fail in the above duties.

10.2 WH&S

According to the School of BEES policy (http://www.bees.unsw.edu.au/hs-accountabilities-and-responsibilities), each student is responsible for:

- Taking reasonable care for his or her own health and safety, and
- Taking reasonable care that his or her acts or omissions do not adversely affect the health and safety of other persons, and
- Complying, so far as reasonably able, with any reasonable instruction that is given to ensure UNSW is not in breach of the NSW WHS Act 2011, and
- Complying with UNSW HS policies, procedures and guidelines and BEES HS protocols ,
- Taking action to avoid, eliminate or minimise hazards
- Making proper use of all safety devices and personal protective equipment
- Seeking information or advice regarding hazards and procedures before carrying out new or unfamiliar work
- Being familiar with emergency and evacuation procedures, the location of first aid and emergency personnel and equipment, and if appropriately trained, the use of such equipment.

The School of BEES recognises its obligations to provide a safe working environment for all persons involved in school-related activities. To achieve this goal with regards to teaching and learning, the school adopts the UNSW Health and Safety Policy v4.1 and the H336 HS Responsibility, Authority and Accountability Procedure. These documents stipulate that everyone attending a UNSW workplace must ensure their actions do not adversely affect the health and safety of others. This outcome is achieved through the establishment of a documented chain of responsibility and accountability for all persons in the workplace, extending from the Head of School through to the students undertaking courses offered by the School of BEES.

As part of this chain of responsibility and accountability, the course convenor is responsible for ensuring all activities associated with this course are safe. The course convenor has undertaken detailed risk assessments of all course activities and identified all associated potential hazards. These hazards have been minimised and appropriate steps taken to ensure your health and safety. For each activity, clear written instructions are given and appropriate hazard warnings or risk minimisation procedures included for your protection.