GEOS125

Earth Dynamics

S2 Day 2018

Dept of Earth and Planetary Sciences

Contents

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Credit points 3
Prerequisites
Corequisites
Co-badged status GEOS125 external
Unit description Discover how the solid Earth works – investigate the dynamic link between plate tectonics and Earth evolution. This introductory unit is suitable for all students including those wanting to try a natural science. It explores the composition and structure of our planet and the dynamic processes that change our environment. Students become skilled at geoscience techniques that permit detailed study of the Earth, and explore via case studies volcanoes and volcanic hazards, as well as economic geology. The unit provides a strong background in geoscience for further studies in geology, geophysics, geography, museum studies, geomorphology, astronomy and environmental science; and insights into Earth materials and their relationship to the environment for students of economics, physics, archaeology, chemistry, biology, marine science and education. This unit involves eye-opening field trips in tutorial classes around campus and a day trip across the Blue Mountains.

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:

Developed an understanding of the scientific method

Developed a capacity to employ appropriate geoscientific tools to solve problems and to interpret the results

Developed an understanding of how to read geology maps to draw cross-sections and/or interpret geological history

Developed an understanding of the tools and methods that are used in the identification of minerals and/or rocks

Improved competence in accessing, using and synthesising appropriate information

Enhanced capacity to present ideas clearly with supporting evidence

General Assessment Information

Student Engagement in 100-level Units

In an effort to develop good study skills from the outset the Faculty of Science and Engineering have made participation compulsory for 100 level units - this is now a hurdle assessment for the unit i.e., you must comply with this requirement to pass the unit.

While we expect 100% attendance at all workshops and practical laboratory classses to guarantee a successful outcome, the GEOS125 hurdle assessment requires that you attend and participate in at least 10 out of the 13 weekly workshops (Tuesday 4-6pm) and practical laboratory classes (Fridays). Your tutor will provide you with further details on what we define as participation.

Please contact your convenor [nathan.daczko@mq.edu.au] as soon as possible if you have difficulty attending and participating in any classes. We will endevour to enable you to attend a class later in the week or during the on-campus session for the externals. If there are circumstances that mean you miss a class, you can apply for a disruption to studies request through ask.mq.edu.au and if approved this practical will be removed from your record.

The dates for submission of assessment tasks are listed on the schedule. Extensions for submission of assessment tasks will be given only for illness or misadventure, which must be supported by documentation through the online request portal (ask.mq.edu.au). Assessment tasks submitted late without approval will be penalised 10% of the potential total mark per day late. Students must keep a photocopy of their reports.

Assessment Tasks

Name	Weighting	Hurdle	Due
Weekly quiz	20%	No	each week
Case Study I: Volcanoes	15%	No	14/08; 28/08; 11/09
Case Study II: Hartley	10%	No	30/10
Hartley quiz and field notes	5%	No	30/10
Final examination	50%	No	to be advised
Participation requirement	0%	Yes	Each week

Weekly quiz

Due: **each week**
Weighting: **20%**

The weekly online quizzes will examine 1) the workshop topics of the previous week, 2)

compulsory pre-reading of information for the next laboratory practical class, 3) assigned weekly textbook readings, and 4) revision questions from any preceding week.

On successful completion you will be able to:

- Developed an understanding of how to read geology maps to draw cross-sections and/or interpret geological history
- Developed an understanding of the tools and methods that are used in the identification of minerals and/or rocks

Case Study I: Volcanoes

Due: **14/08; 28/08; 11/09**
Weighting: **15%**

Volcanoes case study: You will be given specific details of what is expected when you begin each case study. Generally, each case study will involve practical components and a written report and your use of English and referencing the source of your ideas is important. Details of the required formatting of reports are given in the unit of study booklet (Part III – Case Studies). The Volcanoes case study will be due in three parts over the first half of session. The due dates are on the unit schedule in the unit of study booklet (Part I – Unit Schedule).

Week 3 – Tuesday 14th August (3pm): Part A of Volcanoes Case Study is due

Week 5 – Tuesday 28th August (3pm): Part B of Volcanoes Case Study is due

Week 7 – Tuesday 11th September (3pm): Part C of Volcanoes Case Study is due

On successful completion you will be able to:

- Developed an understanding of the scientific method
- Developed a capacity to employ appropriate geoscientific tools to solve problems and to interpret the results
- Developed an understanding of how to read geology maps to draw cross-sections and/or interpret geological history
- Improved competence in accessing, using and synthesising appropriate information
- Enhanced capacity to present ideas clearly with supporting evidence

Case Study II: Hartley

Due: **30/10**
Weighting: **10%**

Hartley Case study: You will be given specific details of what is expected when you begin each case study. Generally, each case study will involve practical components and a written report and your use of English and referencing the source of your ideas is important. Details of the required formatting of reports are given in the unit of study booklet (Part III – Case Studies).

During session 2 break: Thursday 20th OR Friday 21st September: Full-day fieldtrip to Hartley

Week 12 – Tuesday 30th October (3pm): Report for Hartley Case Study is due

Week 12 – Tuesday 30th October (4pm, in workshop): Hartley Case Study Quiz

On successful completion you will be able to:

- Developed an understanding of the scientific method
- Developed a capacity to employ appropriate geoscientific tools to solve problems and to interpret the results
- Developed an understanding of how to read geology maps to draw cross-sections and/or interpret geological history
- Improved competence in accessing, using and synthesising appropriate information
- Enhanced capacity to present ideas clearly with supporting evidence

Hartley quiz and field notes

Due: **30/10**
Weighting: **5%**

Hartley Quiz - to be completed during the workshop in week 12.

Hartley field notes - to be handed in at the conclusion of the Hartley field trip.

On successful completion you will be able to:

- Developed an understanding of the scientific method
- Developed a capacity to employ appropriate geoscientific tools to solve problems and to interpret the results
- Developed an understanding of the tools and methods that are used in the identification of minerals and/or rocks
- Enhanced capacity to present ideas clearly with supporting evidence

Final examination

Due: **to be advised**
Weighting: **50%**

Final examination (2 hours long): The final exam will cover material from the workshops, textbook readings, class exercises and case studies. Questions will draw on information and ideas from different modules to give an integrated view of the unit. The exam will include questions that ask you to apply your knowledge to interpret and solve problems. Past exam papers are available on the MQ Library website.

If you receive special consideration for the final exam, a supplementary exam will be scheduled in the interval between the regular exam period and the start of the next session. By making a

special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. You can check the supplementary exam information page on FSE101 in iLearn (bit.ly/FSESupp) for dates, and approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

On successful completion you will be able to:

- Developed a capacity to employ appropriate geoscientific tools to solve problems and to interpret the results
- Developed an understanding of how to read geology maps to draw cross-sections and/or interpret geological history
- Developed an understanding of the tools and methods that are used in the identification of minerals and/or rocks
- Enhanced capacity to present ideas clearly with supporting evidence

Participation requirement

Due: **Each week**
Weighting: **0%**
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

While we expect 100% attendance at all workshops and practical laboratory classses to guarantee a successful outcome, the GEOS125 hurdle assessment requires that you attend and participate in at least 10 out of the 13 weekly workshops (Tuesday 4-6pm) and practical laboratory classes (Fridays). Your tutor will provide you with further details on what we define as participation.

On successful completion you will be able to:

- Developed an understanding of the scientific method
- Developed a capacity to employ appropriate geoscientific tools to solve problems and to interpret the results
- Developed an understanding of how to read geology maps to draw cross-sections and/or interpret geological history
- Developed an understanding of the tools and methods that are used in the identification of minerals and/or rocks
- Improved competence in accessing, using and synthesising appropriate information
- Enhanced capacity to present ideas clearly with supporting evidence

Delivery and Resources

INTRODUCTION

Earth Dynamics is a hands on unit of study, that sets out to acquaint you with the essential features of the materials that constitute the Earth, processes that shape the Earth's surface, and the interaction of people and the geologic environment. The unit is an **introduction to geology** and not only forms the vital stepping stone for future studies in geology, but also sets out to give students from other disciplines a basic understanding of the physical Earth that will be helpful in studies and careers in environmental science, geomorphology, geophysics, biology, geodesy, gemology and economics.

We aim to help you develop the skills necessary for study of the physical Earth. By the end of the unit, you should have the skills to:

- Make critical observations for yourself in the field
- Identify minerals and rocks
- Determine geometric relationships between rock units, as depicted on simple geological maps
- Use geological information to better understand the physical Earth

These different threads come together via an understanding of the cyclic nature of rock-forming and rock degrading processes of our planet, in terms of the Plate Tectonic Theory.

Geology is a vital, living science that touches our everyday lives. For example, materials such as ore deposits, diamonds, coal and petroleum are essential to our modern civilisation, and precious stones add to our appreciation of nature's beauty. Processes such as volcanism, earthquakes, landslides and erosion may dramatically affect our well being. Knowledge you gain of these materials and processes, based on scientific approaches of observation, testing and evaluation, will assist you towards a better understanding of this planet, Earth.

STUDY PROGRAM

Students coming into this unit have a variety of backgrounds, since there are no set pre-requisites. Some of you will have no geology or physical geography at all in your previous studies, others will have taken Earth and Environmental Science at HSC level, and still others will have completed GEOS112 Planet Earth here at Macquarie. However, previous studies in geology and related subjects are not necessary and in terms of your geological knowledge, by the end of this unit it should not matter what background you had before you started. In spite of this, inevitably in the early stages some of you might find many more new concepts to come to grips with than others. DO NOT BE DISCOURAGED, as by persevering into the unit of study, you will gain the satisfaction of seeing how the pieces of the overall Earth puzzle start to come together.

This unit concentrates on six major themes that will be explored and revisited in various ways throughout the unit. These themes include:

- Deep time (prehistorical and ancient geological past)

- Plate tectonics
- The rock cycle
- Geological skills e.g. mapping and mineral/rock recognition
- How geoscience can be used to solve some of the problems of the 21st century

There are three modules that investigate different aspects of geoscience. The main ideas and objectives for the modules are:

Module 1: Tools of Geoscience (approximately one-third of the unit)

By the end of this unit students should be able to:

- Understand that the rocks we see today have undergone change through geologic time and are still undergoing change (this is known as the rock-cycle)
- Recognise that there are 3 main groups of rocks (igneous, sedimentary and metamorphic) and be able to distinguish typical hand specimen examples of each type (Note: this skill will be reinforced throughout the unit)
- Understand the basic concepts of the plate tectonic theory and appreciate that it is the major unifying idea of geoscience
- Describe the main tools of geoscience and give examples of how they are used: e.g. mapping, satellite imagery, air photos, geophysical investigations, Geographic Information Systems (GIS)
- Read and interpret topographic maps, and understand how contours are constructed and how to interpret them
- Use geological maps including legends, scales, grid references, etc. to solve simple problems and navigate
- Understand that maps are two dimensional representations of a three dimensional world, and the graphical techniques that are used to illustrate what is under the surface (e.g. making and interpreting geological cross sections)
- Explain the sequence of events that led to the geological configuration of an area (geological history)

Module 2: Hot Rocks (approximately one-third of the unit)

By the end of this unit students should be able to:

- Analyse volcanic processes, the landforms produced, and volcanic hazards
- Account for differences between volcanoes in terms of lava type (chemistry, appearance, explosiveness, etc) and their geographic position in relation to plate tectonic theory (e.g. boundary, intra-plate, etc)
- Examine intrusive igneous processes (e.g. magma composition and behaviour), and the

features these processes produce
- Recognise common volcanic and intrusive igneous rocks and be able to use a classification scheme to identify them; interpret the origin of igneous rocks from hand specimens and field relations
- Describe and appreciate the significance of deeper Earth processes (e.g. mantle plumes)
- Understand the impact of plate tectonic theory on igneous processes
- Identify the main silicate rock-forming minerals
- Comprehend the basic chemical structure of the main groups of minerals (e.g. silica tetrahedra) and how this structure determines their appearance and physical properties
- Illustrate how knowledge of igneous processes can be useful to people (e.g. creation of ore minerals, “hot dry rock” as a source of energy; building materials)

Module 3: Rocks Under Stress and Deep Earth (approximately one-third of the unit)

By the end of this unit students should be able to:

- Comprehend that metamorphism causes change to existing rocks by the application of heat and pressure
- Comprehend that rocks slowly change form and shape under the application of forces
- Match parent rocks with metamorphosed equivalents
- Establish that rock microstructure and the existence of particular minerals indicate that rocks have undergone change
- Discern the difference between contact and regional metamorphism and be able to distinguish this difference in hand specimens showing a visible difference
- Understand the concept of metamorphic grade
- Use and interpret geological maps with intrusive rock bodies and simple structural features
- Describe how knowledge of metamorphic processes can be of benefit to people
- Understand the relationship between metamorphism, deformation and plate tectonic theory
- Understand how geophysics is used to understand the deep Earth and to monitor geological hazards

STUDENT LEARNING EXPERIENCES

This unit can be seen as two interconnected streams. A workshop stream involving short presentations and hands on activities that will give a broad overview of the topic, provide background information and introduce new ideas and concepts that link in with the other stream. Parallel to the workshop stream are a series of laboratory and field-based activities and case

study workshops.

There will be two case studies. These case studies will be extended enquiries into real geo-scientific problems, extending over several weeks. These problems are different to the ones that you would typically find in textbooks, and more closely resemble the investigations that scientists face in the real world, with many interacting factors and a number of possible solutions.

Each of the case studies will allow you to explore the ideas in depth and will provide an effective and, we hope, enjoyable method of learning. There is also the added benefit of providing you with opportunities to develop generic skills such as problem solving, teamwork, communication, accessing and evaluating information and in using scientific approaches to solve problems.

You will be working individually or in small teams for each case study, both in attempting to solve the problem and to produce a final report. The reports will be awarded marks for your individual synthesis. You will be expected to do substantial research outside of the scheduled time (e.g. library and/or web-based literature search).

FIELD TRIPS

During this unit of study you will be required to participate in two field trips: one on-campus and one off-campus. These excursions form an essential part of the unit and give you an introduction to field geology. You should take special note of the following:

Equipment: The basic requirements are a hand lens, magnet, and some method of testing mineral hardness (e.g. a pocket knife, copper coin, etc.). Buy a geological hammer only if you intend to continue in a geological field. As the weather is not always kind, note taking can be a problem if ballpoint or ink pens are used. Pencils are recommended. Bring several, and keep them sharp. Learn to be neat and tidy in these initial stages, and form a good habit early. It is much easier to discipline yourself now than to change habits later.

Clothing: Everyone has their own idea of comfort, but some common features of field clothing are obvious. Wear sensible, tough footwear, such as boots or strong sneakers. Thongs, fashion shoes and street shoes are useless and unacceptable. We will be walking over some irregular rock outcrops and may be in snake-infested areas. We cannot guarantee good quality weather; so you should have waterproof clothing. Long trousers, such as jeans, are safer than shorts. Bring a hat and sunscreen.

TEXTS AND REFERENCES

Unit of study booklet

This is available through the University Co-Operative Bookshop and contains the workshop activities, laboratory practicals and case study assignments. The booklet is essential for you to have to follow the unit. The completed worksheets are invaluable as an aid during revision for the examination.

Textbook

The recommended text is:

Tarbuck, E.J., Lutgens, F.K. and Tasa, D. (2016). Earth: An introduction to Physical Geology (12th Global). Pearson . ISBN 9781292161839

This gives more background information, often written from a different perspective from the workshops and practical class notes. It also contains photographs and diagrams for use in the workshops and laboratory exercises. In the library you may find several other basic textbooks on Physical Geology that will be of use to you. The other text mentioned is Merali, Z. and Skinner B.J. Visualizing Earth Science. Wiley. ISBN 978-0-471-74705-5.

Reading List

You may find the following books helpful for reference. They should provide useful supportive material to the workshops, case studies and laboratory exercises, and supplement the prescribed textbook and the Unit of Study booklet.

Earth Dynamics is a subject relying heavily on observation, so it will be of great help to look at a variety of illustrations of the features that are covered in the unit of study. The books listed below are generally well illustrated, with striking colour photographs and diagrams.

** indicates a book in Special Reserve in the Library; * indicates a book on 3-day loan.

**Branagan, D.F. and Packham, G.H., 2000. Field geology of NSW. NSW Dept of Mineral Resources. Sydney. QE45.B7

*Busch, R.M., Tarbuck, E.J. and Lutgens, F.K, 1993. A study guide to accompany "The earth — an introduction to physical geology". Merrill. QE28.2.T37

*Cattermole, P., 2000. Building Planet Earth. Cambridge University Press. QE26.2.C384

*Hamblin, W.K. 1998. Earth's Dynamic Systems. Macmillan (8th Ed.) QE28.2.H35

*Hamblin, W.K. and Howard, J.D. 1995. Exercises in Physical Geology. QE28.2.H36

**Herbert, C. and Helby, R., 1980. A Guide to the Sydney Basin. Geological Survey of NSW Bulletin 26. QE341.N4

**Kimberley, M.M and Kimberley, S.J. 1995. Study guide to Skinner/Porter's The Dynamic Earth: an introduction to physical geology. Third Edition. Wiley (3rd Ed) QE28.2K56

*Merritts, D.J., De Wet, A., and Menking, K., 1998. Environmental Geology: an earth system science approach. Freeman, New York. QE38.M47

*Monroe, J.S. and Wicander, R. 1992 Physical Geology — exploring the earth. Harper Educational Publ.; West Publ. Co St. Paul. QE28.2.M655

*Montgomery, C.W., 1993. Physical Geology. Wm C. Brown (3rd Ed.) QE28.2.M66

*Morrison, R., 1988. Voyage of the Great Southern Ark. Ure Smith Press. QE340.M67

*Morton, R.D., 1995. Student’s Companion to Skinner and Porter’s The Dynamic Earth; an introduction to Physical Geology, Third Edition. Wiley QE28.2.S552

*Murck, B.W., Skinner, B.J. and Porter, S.C., 1996. Environmental Geology. Wiley and Sons, New York. QE38.M87/1996

*Plummer, C.C. and McGeary, D., 1999. Physical Geology. Wm C. Brown Publ., Iowa (8th Ed.). QE28.2.P58

*Press, F. and Siever, R. 1998. Understanding Earth. Freeman, New York (2nd Ed.) (replaces Earth, 4th Ed.). QE28.P9

**Scheibner, E., 1999. The geological evolution of New South Wales. Dept of Mineral Resources. QE341.S296

**Skinner, B.J. and Porter, S.C., 2000. The Dynamic Earth: an introduction to physical geology. Wiley , 4th Ed. QE28.2.S55

**Skinner, B.J., Porter, S.C. and Botkin, D.B., 1999. The Blue Planet. Wiley , 2nd Ed. QB631.S57

*Smith, D.G., 1981. The Cambridge Encyclopedia of Earth Sciences Cambridge Univ. Press, Cambridge. QE26.2.C35

*Stanley, S.M., 1989. Earth and life through time. W.H. Freeman and Company, N.Y. QE28.3.S73

*Tarbuck, E.J., Lutgens, F.K. and Tasa, D. (2016). Earth: An introduction to Physical Geology (12th Global). Pearson . ISBN 9781292161839

**Van Andel, T.H., 1994. New views of an old planet: continental drift and the history of the earth. Cambridge Univ. Press, Cambridge (2nd Ed.). QE26.2.V36

*Veevers, J.J., 2000. Billion-year earth history of Australia and neighbours in Gondwanaland. GEMOC Press, Sydney. QE340.B55

CD-ROMS

**Dunning, J and Onesti, L.J., 1998. Earth Matters. Freeman and Co., New York. QE38.D8

**Tasa, D., 1999. Illustrated dictionary of earth science. Tasa Graphic Arts. QE5.I45

Library Loans

The Library at Macquarie will have provided you with information on library loans. The procedures differ for metropolitan and country students. Please familiarise yourself with the procedures appropriate in your case. If you have any enquiries contact the Library on (02) 9850-7500.

Unit Schedule

Days	Week	Workshop Tuesday 4–6	Laboratory Practical Fri 9-12, 12-3, or 3-6	
31 Jul	1	A tour of Planet Earth [Stephen Foley] (1.4, 1.6, 2, 9.5)*	Practical 1: Topographic Maps	Volcanoes Case Study
7 Aug	2	Minerals [Elena Belousova] (3)	Practical 2: Campus Excursion	

14 Aug	**3**	The Deep Earth-Volcano Connection [Lucy McGee] (4, 5)	Practical 3: Geological Map Reading	
21 Aug	**4**	Explosive volcanism and hazards [Lucy McGee] (4, 5)	Practical 4: Minerals and Mineral Properties	
28 Aug	**5**	Supervolcanoes and below [Lucy McGee] (4, 5)	Practical 5: Volcanic (Extrusive) Rocks	
4 Sep	**6**	Geochemical Tools and Dating the Earth [Dorrit Jacob] (9.4, PDF of chapter in iLearn)	Practical 6: Plutonic (Intrusive) Rocks	
11 Sep	**7**	Hydrocarbons and other fuels [Simon George] (7, 23.2)	Practical 7: Introduction to Geochemistry	
		Session 2 break		
2 Oct	**8**	Metamorphism [Nathan Daczko] (8)	Practical 8: Metamorphic Minerals	Hartley Case Study
9 Oct	**9**	Crustal Deformation [Nathan Daczko] (10, 14)	Practical 9: Metamorphic Rocks	
16 Oct	**10**	Earthquakes and Earthquake Hazards [Kate Selway] (11)	Practical 10: Geological Cross Sections	
23 Oct	**11**	Earth's Interior [Juan Carlos Afonso] (11,12)	Practical 11: Geological History	
30 Oct	**12**	Understanding the Earth System [Stephen Foley] (22)	Practical 12: Exam Revision - Rocks	
6 Nov	**13**	Exam revision [Nathan Daczko]	Practical 13: Geo Jeopardy	

*Numbers in brackets represent chapters from *Earth: An introduction to Physical Geology*

IMPORTANT DATES:

Week 3 – Tuesday 14th August (3pm): Part A of Volcanoes Case Study is due

Week 5 – Tuesday 28th August (3pm): Part B of Volcanoes Case Study is due

Week 7 – Tuesday 11th September (3pm): Part C of Volcanoes Case Study is due

During session 2 break: Thursday 20th OR Friday 21st September: Full-day fieldtrip to Hartley

Week 12 – Tuesday 30th October (3pm): Report for Hartley Case Study is due

Week 12 – Tuesday 30th October (4pm, in workshop): Hartley Case Study Quiz

Exam: To be advised once the examinations timetable is drawn up

TIME ALLOCATION

According to Macquarie University guidelines, you are required to spend 39 hours of study per credit point. For GEOS125 this works out to approximately two hours per week in workshops, approximately three hours per week at the practical laboratory sessions, one day on the off campus field trip and approximately six to seven hours per week doing at home study. Conscientious use of this time, particularly if it is spread over the whole semester will provide its reward.

EVALUATION

We are interested in your ideas about how the unit is progressing and how it can be improved. At certain points during the semester, you will be invited to fill out a brief survey to give us some feedback on how you find the unit content and presentation methods.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
- Grade Appeal Policy
- Complaint Management Procedure for Students and Members of the Public
- Special Consideration Policy *(**Note:** The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.)*

Undergraduate students seeking more policy resources can visit the Student Policy Gateway (htt

ps://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/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/study/getting-started/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

- Developed an understanding of how to read geology maps to draw cross-sections and/or interpret geological history
- Improved competence in accessing, using and synthesising appropriate information
- Enhanced capacity to present ideas clearly with supporting evidence

Assessment tasks

- Weekly quiz
- Case Study I: Volcanoes
- Case Study II: Hartley
- Hartley quiz and field notes
- Final examination
- Participation requirement

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:

Assessment task

- Participation requirement

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:

Assessment task

- Participation requirement

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

- Developed an understanding of the scientific method
- Developed a capacity to employ appropriate geoscientific tools to solve problems and to interpret the results
- Developed an understanding of how to read geology maps to draw cross-sections and/or interpret geological history
- Developed an understanding of the tools and methods that are used in the identification of minerals and/or rocks
- Improved competence in accessing, using and synthesising appropriate information
- Enhanced capacity to present ideas clearly with supporting evidence

Assessment tasks

- Weekly quiz
- Case Study I: Volcanoes
- Case Study II: Hartley
- Hartley quiz and field notes
- Final examination
- Participation requirement

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

- Developed an understanding of the scientific method
- Developed a capacity to employ appropriate geoscientific tools to solve problems and to interpret the results
- Developed an understanding of how to read geology maps to draw cross-sections and/or interpret geological history
- Developed an understanding of the tools and methods that are used in the identification of minerals and/or rocks
- Improved competence in accessing, using and synthesising appropriate information
- Enhanced capacity to present ideas clearly with supporting evidence

Assessment tasks

- Weekly quiz
- Case Study I: Volcanoes
- Case Study II: Hartley
- Hartley quiz and field notes
- Final examination
- Participation requirement

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

- Developed a capacity to employ appropriate geoscientific tools to solve problems and to interpret the results
- Developed an understanding of how to read geology maps to draw cross-sections and/or interpret geological history
- Developed an understanding of the tools and methods that are used in the identification of minerals and/or rocks
- Improved competence in accessing, using and synthesising appropriate information
- Enhanced capacity to present ideas clearly with supporting evidence

Assessment tasks

- Weekly quiz
- Case Study I: Volcanoes
- Case Study II: Hartley
- Hartley quiz and field notes
- Participation requirement

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

- Developed an understanding of how to read geology maps to draw cross-sections and/or interpret geological history
- Improved competence in accessing, using and synthesising appropriate information
- Enhanced capacity to present ideas clearly with supporting evidence

Assessment tasks

- Weekly quiz
- Case Study I: Volcanoes
- Case Study II: Hartley
- Hartley quiz and field notes
- Final examination
- Participation requirement

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 outcome

- Improved competence in accessing, using and synthesising appropriate information

Assessment tasks

- Case Study I: Volcanoes
- Case Study II: Hartley
- Participation requirement

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 outcome

- Improved competence in accessing, using and synthesising appropriate information

Assessment tasks

- Case Study I: Volcanoes
- Case Study II: Hartley
- Participation requirement

Changes from Previous Offering

This year sees some changes to the GEOS125 offering and we ask for your patience and feedback. There have been major changes to the content delivery format to incorporate more hands on activities in the workshop and laboratory components. Participation in both the workshop on Tuesday afternoons and the laboratory practical components on Fridays is compulsory. We are shortening the laboratory practical component from 3 hours to 2 hours, but the third hour of the practical laboratory sessions will be used to work on the case studies.

Presentation of Case Study reports

You are required to research, prepare and write the case study reports at the standard expected at tertiary level. Since most of what you learn is tested in written form, it is essential that you learn to write effectively. Organisation is the key to achieving this, and the following steps should assist you.

Preparation

1. Determine what is required in the case study report. Make sure you understand each word used to ensure that you are writing to the topic set, not to one of your own

invention.

2. Read the relevant unit material and generate a list of key words, which will help you locate other references in the Library. Do this early. Remember that reference books may be hard to find if you leave your library research too late.
3. When taking notes from a reference always note the bibliographical information and Call Number. If you write down a quotation, take a note of the page it was on. There is nothing more frustrating than having to look back through a book for one sentence.

The Outline

1. Introduction. Define terms and outline your approach to the topic.
2. Discussion. This section is for explanation and discussion of the topic. It may help to write down a list of major points that will become your paragraphs, so that you can arrange your notes under each point.
3. Conclusion. This is not a reiteration of the discussion, but a summary statement that rounds off the report.

The Drafts (at least one — more probably two or three)

1. Keep referring back to the question — have you strayed from the topic?
2. Single sentences or paragraphs should not express too many ideas. A logical development of your theme should be the aim throughout the essay.
3. In your initial draft, do not worry too much about the word limit. It is a simple matter to cut down extraneous or repetitive material in subsequent rewrites — in fact this should be your aim.
4. Support your statements with facts and references.
5. References: quotations should be used only if the point being made is vital to your argument and if you could not express it better yourself. If you paraphrase, you must acknowledge your authority as you would when quoting directly – after the paraphrased section or quotation, i.e. (Smith, 1981, p.132). Make sure you document this reference in your Bibliography or list of References. Remember, plagiarism is cheating! All references must be clearly documented at the end of your assignment. For more details on referencing of material see Appendix 2 of your Unit of Study Booklet.

The Final Product

1. If possible, allow a few days between writing your final draft and the finished report, to allow you to critically read and edit it. There is a danger that if it is too fresh in your mind, you will read what you think is there, rather than what you have actually written. Read your final draft through several times — once for fluency and clarity of ideas, once for

punctuation and once for spelling. For clarification of problems, refer to an authority such as the Australian Government Publishing Service Style Manual.

2. Write (or type — learn now if you are an untidy writer) your assignment for submission, and then check it again. Is there a title, your name on each page, page numbers, etc.?
3. Submit your case study report on or before the due date to the GEOS125 assignment box in the ELS Centre (level 1, E7A), and keep a digital copy or photocopy. Assignment boxes are located in the reception area of the ELS Centre (Room 101), which is on the ground floor at the western end of building E7A. Campus maps are available at http://www.bgo.mq.edu.au/campus.htm. The Centre opens from 8.30am to 5.30pm on Monday to Friday. An after hours submission box is located at the entrance to E7A, (a labelled slot in the door nearest to E5A). All assignments are to be submitted **before** class on the date specified and must include a completed and signed coversheet stapled to the front cover. The Assignment Cover Sheets are partly filled out for you at the end of the unit outline or alternatively, these can be downloaded from the web at www.els.mq.edu.au, click on ELS Assignment Cover Sheet.

Formatting

1. All typed text submitted for case studies is to be 12 point font at 1.5 line spacing. Margins should be approximately 2cm. Place your name in the header and number each page.
2. Page limits should be strictly adhered to.
3. In all that you hand in, marks will be given for “communication”; that is how effectively you communicate your ideas. This will include how well your text/maps/profiles/sketches convey your concepts, and how well written your report is (including correct use of English and of referencing procedures – see Appendix 2).

Now, perhaps, you can see how important it is to start the whole process early if you are to do a good job. If you are having problems along the way, consult your Tutor, and consult a how-to-do-it text.