GEOS207

Volcanoes and Igneous Processes

S1 Day 2019

Dept of Earth and Environmental Sciences

Contents

General Information

Unit convenor and teaching staff
Convenor
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Credit points
3

Prerequisites
GEOS125

Corequisites

Co-badged status

Unit description
This unit studies rocks that are the result of melting deep within the Earth, encompassing the mineralogy and compositions of igneous rocks, including intrusive and volcanic rocks. The unit covers the theory and interpretation of the processes of melting and crystallisation, emphasising laboratory skills in the hands-on description and interpretation of rocks, minerals and related materials, applying optical studies on thin sections and electron microscopy as well as geochemical methods. Theoretical knowledge and skills developed in this unit are used in case studies and projects that are tailored to each student's interests – minerals, rocks, fossils, soils, ceramics and/or concrete – to solve controversy and debate across a wide range of disciplines. Microscopic examination of natural and man-made materials opens a new world of discovery to geologists, palaeobiologists, soil scientists, archaeologists and engineers alike.

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:

Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
Develop the skills to recognise minerals in thin section and interpret rock genesis, crystallisation history and geodynamic setting from thin sections, phase diagrams and geochemical data
Develop the skills to analyse and understand volcanic eruption types from rocks and thin sections and extrapolate this knowledge to assess hazards posed by certain eruption styles
Understand how to present ideas clearly with supporting evidence in a number of formats
Develop the skills needed to undertake projects of a complex nature
Understand how to apply geoscientific principles to understanding the world around you
Understand how to access, use and synthesise appropriate information
Develop effective team work skills

Assessment Tasks

Name	Weighting	Hurdle	Due
Online Quizzes	10%	No	each week
Open University Online Course	10%	No	various
Midterm Online Quiz	10%	No	19th of April
Case Study - Part 1	10%	No	29th of April
Case Study - Part 2	10%	No	3rd of June
Final Examination	50%	No	Week 14

Online Quizzes

Due: **each week**
Weighting: **10%**

There will be an online quizz each week that has a lecture. The questions are drawn from the information given in lectures. You will be required to complete a Virtual Petrographic Microscope task in some of these quizzes submit your answers in the respective online quiz.

On successful completion you will be able to:

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Open University Online Course

Due: **various**
Weighting: **10%**

An introduction to minerals and rocks under the microscope - Free online course offered by the Open University (UK)

http://www.open.edu/openlearn/science-maths-technology/science/introduction-minerals-and-rocks-under-the-microscope/content-section-0?active-tab=description-tab

You will have to enrol online for this, enrolment is free of charge.

This course consist of three parts.

Part 1 is due Wednesday 06 March 5pm (hand in screenshot), take online quiz

Part 2 is due Wednesday 13 March 5pm (hand in screenshot), takes online quiz

Part 3 is due Wednesday 20 March 5pm (hand in statement of participation), take online quiz

60% of the mark will be given for completion of the course and 40% or the mark will be based on the online quizzes covering the content of the course

On successful completion you will be able to:

- Develop the skills to recognise minerals in thin section and interpret rock genesis, crystallisation history and geodynamic setting from thin sections, phase diagrams and geochemical data
- Develop the skills needed to undertake projects of a complex nature
- Develop effective team work skills

Midterm Online Quiz

Due: **19th of April**
Weighting: **10%**

Midterm Online Quiz – various questions covering the past 7 weeks of lectures and practicals

On successful completion you will be able to:

- Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
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Case Study - Part 1

Due: **29th of April**
Weighting: **10%**

The case study is given out in week 4 to be handed in in the semester break. It is expected that students work on this assignments continuously until the hand in date but outside the face-to-face sessions. Part 1 of the case study draws on all topics covered and skills acquired during the first half of the unit until the semester break (after week 7). Amongst other materials, the case study will contain thin section images to be analysed using the Virtual Petrographic Microscope (VPM) software or its successor ImageMatrix (tba).

On successful completion you will be able to:

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Case Study - Part 2

Due: **3rd of June**
Weighting: **10%**

Part 2 of the case study starts in week 11 to be handed in in week 13 (Monday. 3rd of June 5pm) by email to the convenor.

The 'Volcanoes 1 and 2' practicals undertaken in weeks 11 and 12 will be assessed:

Week 11 Practical: Questions 1-4 assessed as complete/incomplete* and Questions 5-7 will be marked out of 5%.

Question 5a-d = 2%

Question 6 = 2%

Question 7 = 1%

Week 12 Practical: All questions need to be completed (assessed as complete/incomplete*) and assessment of rock names in the stratigraphic column (5%).

7/7 rock names correct = 5%

5-6/7 rock names correct = 4%

3-4/7 rock names correct = 3%

2/7 rock names correct = 2%

1/7 rock names correct = 1%

*Any incomplete practicals will only be able to achieve a maximum of 2% out of 5% each

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formats
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Final Examination

Due: **Week 14**
Weighting: **50%**

The final exam will cover material from the lectures, class practical exercises and case studies. Questions will draw on information and ideas from the whole unit 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.

On successful completion you will be able to:
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Delivery and Resources

This unit can be seen as three interconnected streams. An online lecture stream will give a broad overview of the topics, provide background information and introduce new ideas and concepts that link in with the laboratory practical and case study streams.

There will be one case study submitted in two parts throughout the semester. The case study is an extended assignment that covers all skills acquired in the unit and provide in depth individual learning experience outside the face-to-face sessions.

You will be working individually for the case study. However, you are encouraged to consult with others in the class. You will be expected to do substantial research outside of the scheduled time (e.g. library and/or web-based literature search, data processing and plotting).

Time Allocation

According to Macquarie University guidelines, you are required to spend 39 hours of study per credit point. For GEOS207 this works out to approximately four hours per week at the lecture/ laboratory sessions, and approximately six 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.

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 (https://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 published on platform other than eStudent, (eg. iLearn, Coursera etc.) 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 or if you are a Global MBA student contact globalmba.support@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

If you are a Global MBA student contact globalmba.support@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

- Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
- Understand how to present ideas clearly with supporting evidence in a number of formats

- Understand how to access, use and synthesise appropriate information
- Develop effective team work skills

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

- Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
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- Develop effective team work skills

Assessment tasks

- Open University Online Course
- Case Study - Part 1
- Case Study - Part 2

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

- Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
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- Understand how to access, use and synthesise appropriate information

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.

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Assessment tasks

- Online Quizzes
- Open University Online Course
- Midterm Online Quiz
- Case Study - Part 1
- Case Study - Part 2
- 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

- Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
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Assessment tasks

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- Open University Online Course
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- Case Study - Part 1
- Case Study - Part 2
- 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

- Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)

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Assessment tasks

- Online Quizzes
- Open University Online Course
- Midterm Online Quiz
- Case Study - Part 1
- Case Study - Part 2
- 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 the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
- Develop the skills to recognise minerals in thin section and interpret rock genesis, crystallisation history and geodynamic setting from thin sections, phase diagrams and geochemical data
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- Develop effective team work skills

Assessment tasks

- Open University Online Course
- Case Study - Part 1
- Case Study - Part 2

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

- Develop the skills needed to select appropriate techniques to characterise and analyse geoscience materials (e.g. rocks, minerals, soils, etc)
- Develop the skills needed to undertake projects of a complex nature
- Develop effective team work skills

Assessment task

- Open University Online Course

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

- Develop the skills needed to undertake projects of a complex nature
- Understand how to apply geoscientific principles to understanding the world around you
- Develop effective team work skills

Assessment task

- Open University Online Course

Changes from Previous Offering

The content of previous offerings of GEOS207 were significantly different. Structural geology and metamorphic petrology have been moved to GEOS272. The unit does not include a field trip anymore, but a similar field trip is now part of GEOS272 held in session 2.