



GEOS272

Geology of Australia - Global Perspectives

S2 External 2014

Earth and Planetary Sciences

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Disclaimer

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General Information

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E7A506

Credit points

3

Prerequisites

GEOS115 or GEOS125

Corequisites

Co-badged status

Unit description

Investigate interdisciplinary perspectives on the origin and geological evolution of Australia and its plate margins. The Australian continent comprises practically all the rock types from over 3.8 billion years of Earth's history. Explore the geology of Australia from Archaean cratonic shields to Proterozoic fold belts and sedimentary basins of the western two-thirds of Australia. Discover the immense continental growth during the Phanerozoic evolution of the eastern margin of Australia. Place the spectacular diversity of Australian geology into a global perspective by exploring the active plate margins around the Australian tectonic plate.

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:

An understanding of the geologic history of Australia. An understanding of the different plate boundaries associated with the Australian Plate.

Competence in accessing, using and synthesising appropriate information through

writing and video. The capacity to employ appropriate computer tools to solve problems related to geochronology.

Application of knowledge to solving problems and evaluating ideas and information.

Students develop the ability to communicate and convey their views in forms effective with different audiences.

Students will be able to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments.

Assessment Tasks

Name	Weighting	Due
<u>Research Topic Paper</u>	15%	Week 4
<u>Video Presentation</u>	10%	Week 4-13
<u>Narrabeen Field work</u>	10%	Week 9
<u>Field Trip Goulburn</u>	10%	Week 11
<u>Quizzes</u>	10%	Bi-weekly
<u>Final Exam</u>	45%	Final exam period

Research Topic Paper

Due: **Week 4**

Weighting: **15%**

A Research topic paper will cover an area of the student's interest in Australian Geology. It will also be the basis for the student's video presentation.

On successful completion you will be able to:

- An understanding of the geologic history of Australia. An understanding of the different plate boundaries associated with the Australian Plate.
- Competence in accessing, using and synthesising appropriate information through writing and video. The capacity to employ appropriate computer tools to solve problems related to geochronology.
- Application of knowledge to solving problems and evaluating ideas and information.
- Students develop the ability to communicate and convey their views in forms effective with different audiences.

- Students will be able to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments.

Video Presentation

Due: **Week 4-13**

Weighting: **10%**

Students will work on their own or in pairs to produce a 5 minute video on their Reserach Topic

On successful completion you will be able to:

- An understanding of the geologic history of Australia. An understanding of the different plate boundaries associated with the Australian Plate.
- Competence in accessing, using and synthesising appropriate information through writing and video. The capacity to employ appropriate computer tools to solve problems related to geochronology.
- Application of knowledge to solving problems and evaluating ideas and information.
- Students develop the ability to communicate and convey their views in forms effective with different audiences.
- Students will be able to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments.

Narrabeen Field work

Due: **Week 9**

Weighting: **10%**

This field trip will familiarise yourself with the key evidence found in rocks that indicate past sedimentary environments. We will visit Narrabeen headland and examine the Narrabeen Group of the Sydney Basin to interpret the paleo-environment that these rocks were deposited in.

On successful completion you will be able to:

- An understanding of the geologic history of Australia. An understanding of the different plate boundaries associated with the Australian Plate.
- Competence in accessing, using and synthesising appropriate information through writing and video. The capacity to employ appropriate computer tools to solve problems related to geochronology.
- Application of knowledge to solving problems and evaluating ideas and information.

- Students develop the ability to communicate and convey their views in forms effective with different audiences.
- Students will be able to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments.

Field Trip Goulburn

Due: **Week 11**

Weighting: **10%**

This field trip will familiarize you with the surrounding area of the Sydney basin, the Lachlan Fold Belt and the geologic history of Eastern Australia

On successful completion you will be able to:

- An understanding of the geologic history of Australia. An understanding of the different plate boundaries associated with the Australian Plate.
- Application of knowledge to solving problems and evaluating ideas and information.

Quizzes

Due: **Bi-weekly**

Weighting: **10%**

5 quizzes will be given through out the semester. They are based on both practicals and lectures

On successful completion you will be able to:

- An understanding of the geologic history of Australia. An understanding of the different plate boundaries associated with the Australian Plate.

Final Exam

Due: **Final exam period**

Weighting: **45%**

The Final Exam will cover material from the lectures, research projects and the practicals.

On successful completion you will be able to:

- An understanding of the geologic history of Australia. An understanding of the different plate boundaries associated with the Australian Plate.
- Application of knowledge to solving problems and evaluating ideas and information.
- Students will be able to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and

environments.

Delivery and Resources

The class will be delivered through iLearn, lectures and tutorials. Materials for the Research Projects will be made available on iLearn. We also encourage you to do your own research. Video assignment adds a technology learning component. We added a lecture and a practical on the New Zealand/Australian plate boundary and now it is external.

Unit Schedule

GEOS 272: The Geology of Australia: Global Perspectives

PROVISIONAL LECTURE AND PRACTICAL SCHEDULE 2014:

Recordings for lectures each week are to be listened to, and for the appropriate weeks, a written practical assignment is included to enhance your understanding of the key concepts. While these are not submitted for assessment, they are examinable.

Week	LECTURE	PRACTICAL	
1 4/08	- Introduction [TR] Overview of Australian Geology/Course introduction	Research Topics discussed	Google Earth – The Australian Plate: Tectonic elements, plate boundaries and economic deposits Video presentation preparation
2 11/08	Snowball Earth [BS]		Neoproterozoic [BS]
3 18/08	Yilgarn, Pilbara and Gawler Economic deposits [BS]		Precambrian ore deposits [BS]
4 25/08	Landforms and Impact craters [TR]		Narrabeen Field Trip [TR]
5 1/09	Sydney Basin [RF]		Work on videos/Narrabeen project
6 8/09	New England Fold Belt [RF]		Google Earth – Mt Todd and Impact Craters in 3D [TR,RB]
7 15/09	Earthquakes and the Australian Plate [YY]		Seismic practical [YY]

8 6/10	New Zealand – Australia Plate Boundary [MT]	Presentations	New Zealand volcanics [MT]
9 13/10	Lachlan Fold Belt [RV/ST]	Presentations	Photomicrograph discussion session – igneous microstructure [RV/TR/ST]
10 20/10	Delamerian [ST/RV]	Presentations	Photomicrograph practical/campus trip – metamorphic microstructure [ST/TR/RV]
11 27/10	Zircons and what they tell us [EB/TR]		Zircon geochronology (isoplot) [EB/TR]
FIELD TRIP	Lachlan Orogen (weekend 24-26 th Oct) Dates TO BE CONFIRMED!!!!		Leader Dick Glen
12 3/11	Australia and the Early Earth [EB/TR]		Zircon geochronology (detrital vs igneous ages) [EB/TR]
13 10/11	The growth of Eastern Australia: Dr. Richard Glen (Australian Geologic Survey)	Presentations	Review for final/video completions

Learning and Teaching Activities

Research Topic Paper

Based on student's interest area

Video Presentation

Based on student's research topic paper

Narrabeen Field project

Report based on field work in the Sydney headlands, northern beaches.

Goulburn Field trip

Two-day field trip to the surrounding Sydney area to view granites and sedimentation.

Google Earth workshops

Week 1 and 2 will have activities that introduce students to the geology of Australia via Google Earth

Lachlan Fold Belt practicals

Weeks 6 and 7 introduce the students to photomicrographs of minerals in thin section and the metamorphic and igneous rocks.

Geochronology workshop

Weeks 11-12 will introduce students to methods of geochronology using zircon and Excel computer program.

Bi-weekly quizzes

Quizzes will be given bi-weekly

Final Exam

The final exam will be on all material and provide an overview of the class.

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

Assessment Policy <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy <http://mq.edu.au/policy/docs/grading/policy.html>

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

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.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/

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://informatics.mq.edu.au/help/>.

When using the University's IT, you must adhere to the [Acceptable Use Policy](#). The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

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 outcome

- Students will be able to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments.

Assessment task

- Field Trip Goulburn

Learning and teaching activity

- Report based on field work in the Sydney headlands, northern beaches.
- Two-day field trip to the surrounding Sydney area to view granites and sedimentation.

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 outcome

- Students develop the ability to communicate and convey their views in forms effective with different audiences.

Assessment tasks

- Field Trip Goulburn
- Final Exam

Learning and teaching activities

- Based on student's interest area
- Based on student's research topic paper
- Report based on field work in the Sydney headlands, northern beaches.
- Two-day field trip to the surrounding Sydney area to view granites and sedimentation.
- Weeks 6 and 7 introduce the students to photomicrographs of minerals in thin section and the metamorphic and igneous rocks.
- Weeks 11-12 will introduce students to methods of geochronology using zircon and Excel computer program.
- Quizzes will be given bi-weekly
- The final exam will be on all material and provide an overview of the class.

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

- An understanding of the geologic history of Australia. An understanding of the different plate boundaries associated with the Australian Plate.
- Application of knowledge to solving problems and evaluating ideas and information.
- Students develop the ability to communicate and convey their views in forms effective with different audiences.
- Students will be able to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments.

Assessment tasks

- Narrabeen Field work
- Field Trip Goulburn
- Quizzes
- Final Exam

Learning and teaching activities

- Based on student's interest area
- Based on student's research topic paper
- Report based on field work in the Sydney headlands, northern beaches.
- Two-day field trip to the surrounding Sydney area to view granites and sedimentation.
- Week 1 and 2 will have activities that introduce students to the geology of Australia via Google Earth
- Weeks 6 and 7 introduce the students to photomicrographs of minerals in thin section and the metamorphic and igneous rocks.
- Weeks 11-12 will introduce students to methods of geochronology using zircon and Excel computer program.
- Quizzes will be given bi-weekly
- The final exam will be on all material and provide an overview of the class.

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

- An understanding of the geologic history of Australia. An understanding of the different plate boundaries associated with the Australian Plate.
- Competence in accessing, using and synthesising appropriate information through writing and video. The capacity to employ appropriate computer tools to solve problems related to geochronology.
- Application of knowledge to solving problems and evaluating ideas and information.
- Students develop the ability to communicate and convey their views in forms effective with different audiences.
- Students will be able to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments.

Assessment tasks

- Research Topic Paper
- Narrabeen Field work
- Final Exam

Learning and teaching activities

- Based on student's interest area
- Based on student's research topic paper
- Weeks 11-12 will introduce students to methods of geochronology using zircon and Excel computer program.
- The final exam will be on all material and provide an overview of the class.

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

- Competence in accessing, using and synthesising appropriate information through writing and video. The capacity to employ appropriate computer tools to solve problems

related to geochronology.

- Application of knowledge to solving problems and evaluating ideas and information.
- Students develop the ability to communicate and convey their views in forms effective with different audiences.
- Students will be able to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments.

Assessment tasks

- Research Topic Paper
- Narrabeen Field work
- Final Exam

Learning and teaching activities

- Based on student's interest area
- Based on student's research topic paper
- Report based on field work in the Sydney headlands, northern beaches.
- Week 1 and 2 will have activities that introduce students to the geology of Australia via Google Earth
- Weeks 11-12 will introduce students to methods of geochronology using zircon and Excel computer program.
- The final exam will be on all material and provide an overview of the class.

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

- Competence in accessing, using and synthesising appropriate information through writing and video. The capacity to employ appropriate computer tools to solve problems related to geochronology.
- Students develop the ability to communicate and convey their views in forms effective with different audiences.

Assessment tasks

- Research Topic Paper

- Video Presentation

Learning and teaching activities

- Based on student's research topic paper

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

- Application of knowledge to solving problems and evaluating ideas and information.
- Students develop the ability to communicate and convey their views in forms effective with different audiences.

Assessment tasks

- Research Topic Paper
- Video Presentation
- Narrabeen Field work
- Final Exam

Learning and teaching activities

- Based on student's interest area
- Based on student's research topic paper
- Report based on field work in the Sydney headlands, northern beaches.
- Two-day field trip to the surrounding Sydney area to view granites and sedimentation.
- The final exam will be on all material and provide an overview of the class.

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

- An understanding of the geologic history of Australia. An understanding of the different plate boundaries associated with the Australian Plate.

Assessment tasks

- Research Topic Paper
- Video Presentation
- Field Trip Goulburn

Learning and teaching activities

- Based on student's interest area
- Based on student's research topic paper
- Report based on field work in the Sydney headlands, northern beaches.
- Two-day field trip to the surrounding Sydney area to view granites and sedimentation.

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:

Assessment tasks

- Research Topic Paper
- Video Presentation
- Field Trip Goulburn

Learning and teaching activities

- Report based on field work in the Sydney headlands, northern beaches.
- Two-day field trip to the surrounding Sydney area to view granites and sedimentation.

Changes from Previous Offering

GEOS272 will be offered in external mode only for 2014. This will mean that some modifications to the unit content and submission style have been made with respect to previous offerings.