



# GEOS2126

## Crustal Deformation and Mountain Building

Session 1, In person-scheduled-weekday, North Ryde 2022

*School of Natural Sciences*

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## General Information

Unit convenor and teaching staff

Nathan Daczko

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Credit points

10

Prerequisites

(GEOS112 or GEOS125 or GEOS126 or GEOS1110 or GEOS1120 or GEOS1130 or EESC1150) and (60cps at 1000 level or above) and special approval

Corequisites

Co-badged status

Unit description

The deformation and metamorphism of rocks is central to mountain building in all tectonic settings. This unit will develop the interdisciplinary skills needed to describe and interpret deformed and metamorphosed rocks. These skills bridge the gap between two-dimensional representations of mountain belts and a three-dimensional understanding of the relationships between rock types, structures and topography. The fourth dimension of time will be integrated by interpreting geological history. These skills will be applied as we explore case studies on the origin and geological evolution of Australia.

## 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:

**ULO1:** apply structural analysis and map reading skills to identify geological field structures, draw cross-sections and interpret geological history.

**ULO2:** combine knowledge of metamorphic systems with microstructural analysis to infer metamorphic processes and evolution.

**ULO3:** demonstrate effective individual and team work skills and apply geoscientific principles to solve real world problems.

**ULO4:** draw on and synthesise appropriate sources of information to examine the

geological evolution and tectonic setting of Australia through time.

## **General Assessment Information**

### **Presentation of Written Reports**

Since most of what you learn is tested in written form, it is essential that you learn to write effectively. You are required to research, prepare and write the research abstracts and field trip reports. Organisation is the key to achieving this, and the following steps should assist you.

#### **Preparation of reports:**

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 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 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.

#### **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 and student number in the header and number each page.

2. Page limits should be strictly adhered to.
3. \* All text-based assessments are to be submitted electronically (via Turnitin) \* Students must keep a copy of their reports.
4. 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).

| Desired Standards |  |
|-------------------|--|
| Grade             | Standard Required  |
| High Distinction  | Demonstrates an extensive knowledge and understanding of the concepts of the course.<br><br>Analysis skills are very sophisticated with a balance of individual components and larger ideas. Capable of generalising from examples and evaluating ideas. |
| Distinction       | Demonstrates a thorough knowledge and understanding of the concepts of the course.<br><br>Analysis skills are sophisticated with a balance of individual components and larger ideas. Capable of generalising from examples and evaluating ideas.        |
| Credit            | Demonstrates a sound knowledge and understanding of the concepts of the course.<br><br>Can break down complex problems into components and synthesise multiple factors into a larger idea. Can evaluate the importance and limitations of data.          |
| Pass              | Demonstrates a basic knowledge and understanding of the concepts of the course.<br><br>Analysis is mainly descriptive. Demonstrates limited capacity to identify complex factors within an idea or to combine multiple factors.                          |
| Fail              | Demonstrates a poor knowledge and understanding of the concepts of the course.<br><br>Analysis skills are very limited.  |
|                   |  |

## Extensions

Extensions for reports and workshop submissions will be given only for illness or misadventure,

which must be supported by documentation and a written request. This request should also indicate the extension period required.

For Tasks 10% or above - No extensions will be granted. There will be a deduction of 5% of the total available marks made from the total awarded mark for each 24 hour period or part thereof that the submission is late (for example, 25 hours late in submission – 10% penalty). This penalty does not apply for cases in which an application for disruption of studies is made and approved. No submission will be accepted after solutions have been posted.

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](http://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.

## Feedback

Feedback on assessment tasks is given in this unit in the following ways:

- 1) Our primary mode of assessment feedback: the assessment marker will present overall feedback to the class, at either a lecture or in a tutorial, on what aspects of the assignment were done best and where improvement is needed in general.
- 2) Scoring full marks for a given component indicates that you did exceptionally well. Alternatively, scoring poorly in a component strongly suggests it required further work.
- 3) Students are strongly encouraged to seek further feedback (at the time it is given or by making an appointment with the assessment marker) if they are unsure of any aspect of the feedback or if they want further feedback.
- 4) In the instance of scoring very poorly overall, you will be provided with written feedback on the assignment indicating where you could improve.

## Assessment Tasks

| Name  | Weighting | Hurdle | Due    |
|---|-----------|--------|--------|
| <a href="#"><u>Vitual Field Trip</u></a>                  | 25%       | No     | Week 8 |
| <a href="#"><u>Australian Geology</u></a>                 | 15%       | No     | Week 7 |
| <a href="#"><u>Multiple Quizzes</u></a>                   | 20%       | No     | Weekly |
| <a href="#"><u>Workshop / Practical Participation</u></a> | 0%        | Yes    | Weekly |

| Name                     | Weighting | Hurdle | Due     |
|--------------------------|-----------|--------|---------|
| <u>Final Examination</u> | 40%       | No     | Week 12 |

## Vitual Field Trip

Assessment Type <sup>1</sup>: Field work task

Indicative Time on Task <sup>2</sup>: 30 hours

Due: **Week 8**

Weighting: **25%**

The virtual fieldwork task is completed online and may comprise multiple components such as preparation for the field trip, virtual field-based tasks and analysis of data collected on the virtual field trip. See iLearn for details of this fieldwork.

On successful completion you will be able to:

- apply structural analysis and map reading skills to identify geological field structures, draw cross-sections and interpret geological history.
- combine knowledge of metamorphic systems with microstructural analysis to infer metamorphic processes and evolution.
- demonstrate effective individual and team work skills and apply geoscientific principles to solve real world problems.
- draw on and synthesise appropriate sources of information to examine the geological evolution and tectonic setting of Australia through time.

## Australian Geology

Assessment Type <sup>1</sup>: Media presentation

Indicative Time on Task <sup>2</sup>: 10 hours

Due: **Week 7**

Weighting: **15%**

The media presentation is a recorded audio-visual presentation delivered to the class and peer-assessed.

On successful completion you will be able to:

- demonstrate effective individual and team work skills and apply geoscientific principles to

solve real world problems.

- draw on and synthesise appropriate sources of information to examine the geological evolution and tectonic setting of Australia through time.

## Multiple Quizzes

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 15 hours

Due: **Weekly**

Weighting: **20%**

The quizzes test knowledge and may be online or in-class. See iLearn for a detailed list of quizzes in this unit.

On successful completion you will be able to:

- apply structural analysis and map reading skills to identify geological field structures, draw cross-sections and interpret geological history.
- combine knowledge of metamorphic systems with microstructural analysis to infer metamorphic processes and evolution.
- demonstrate effective individual and team work skills and apply geoscientific principles to solve real world problems.
- draw on and synthesise appropriate sources of information to examine the geological evolution and tectonic setting of Australia through time.

## Workshop / Practical Participation

Assessment Type <sup>1</sup>: Participatory task

Indicative Time on Task <sup>2</sup>: 0 hours

Due: **Weekly**

Weighting: **0%**

**This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)**

The participatory task is a hurdle assessment and requires participation in more than 75% of workshops / practical classes.

On successful completion you will be able to:

- apply structural analysis and map reading skills to identify geological field structures, draw cross-sections and interpret geological history.
- combine knowledge of metamorphic systems with microstructural analysis to infer metamorphic processes and evolution.
- demonstrate effective individual and team work skills and apply geoscientific principles to solve real world problems.
- draw on and synthesise appropriate sources of information to examine the geological evolution and tectonic setting of Australia through time.

## Final Examination

Assessment Type <sup>1</sup>: Examination

Indicative Time on Task <sup>2</sup>: 20 hours

Due: **Week 12**

Weighting: **40%**

The final examination requires students to apply the new skills and knowledge developed in this unit.

On successful completion you will be able to:

- apply structural analysis and map reading skills to identify geological field structures, draw cross-sections and interpret geological history.
- combine knowledge of metamorphic systems with microstructural analysis to infer metamorphic processes and evolution.
- draw on and synthesise appropriate sources of information to examine the geological evolution and tectonic setting of Australia through time.

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<sup>1</sup> If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

<sup>2</sup> Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

## Delivery and Resources

During this unit we will explore the geology of Australia from Archaean cratonic shields to



Proterozoic fold belts and sedimentary basins of the western two-thirds of Australia, and discover the immense continental growth during the Phanerozoic evolution of the eastern margin of Australia. You will also learn about the main concepts of metamorphic and structural geology, U-Pb geochronology and explore appropriate computer tools to solve problems related to geochronology.

This unit integrates projects, lectures and laboratory classes to develop theoretical knowledge and hands-on experience needed to map, describe and interpret rocks in the field and laboratory. Field studies involve ground-based observations of rock types, rock structures and the relationship between geology and topography.

## Contacts and Communication

Convenors: **A/Prof. Nathan Daczko** (nathan.daczko@mq.edu.au)

School of Natural Sciences, Macquarie University.

Please post questions to iLearn, but if sending email, please include GEOS2126 in the subject line.

We will communicate to you mainly through your student email account/iLearn at Macquarie University. Please make sure you check this email at least weekly.

## Late Enrollments

If you enroll late in the unit, you will have already missed one or more lectures and workshops. It is your responsibility to catch up. Also, you will still be expected to submit all assignments within the remaining time.

Lectures, availability of lecture material and attendance requirements

It is the policy in this unit to encourage students to attend one workshop per week, and make their own notes from the recorded lectures. Recorded lectures will be particularly useful for revision purposes.

## Hours

This is a 10 credit point unit. It is anticipated that you will spend >9 hours per week involved with the unit, including the 3-hour class contact time per week. It is particularly important that you spend plenty of time preparing the major assignments: Research Topic Abstract and Video Presentation, and the field work.

## Set Textbook and Background Reading

- There is no set textbook for this unit. Instead, we have set weekly readings.
- You will need access to iLearn for quizzes and unit resources: Unit Guide, Unit Reader, lectures and

self-directed practicals

- You will use computers in some workshops
- You will need to be able to access books and journal papers in the library
- You will be exposed to a variety of materials and concepts in the practicals

## Unit Schedule

See schedule in unit reader available in iLearn.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au). 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](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

Students seeking more policy resources can visit [Student Policies \(https://students.mq.edu.au/support/study/policies\)](https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au) and use the [search tool](#).

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/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](https://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

## Student Support

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

## The Writing Centre

[The Writing Centre](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

## Student Services and Support

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support](#) including information about finances, tenancy and legal issues

## Student Enquiries

Got a question? Ask us via [AskMQ](#), or contact [Service Connect](#).

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](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.

## Changes from Previous Offering

This unit was last run in 2020 and changed significantly in that year. We expect you to complete five things most weeks:

1) Listen/Watch a recording of the lectures; 2) Read a text resource; 3) Complete a Self-Directed Study practical exercise; 4) take a Quiz in iLearn; and 5) attend the Workshop.

See the schedule in the unit reader for which weeks we expect you to attend campus.