



# EESC2150

## Mass extinctions and the hidden history of Earth

Session 2, In person-scheduled-weekday, North Ryde 2022

*School of Natural Sciences*

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## General Information

### Unit convenor and teaching staff

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### Credit points

10

### Prerequisites

EESC1150 (or GEOS112 or GEOS1110 or GEOS125 or GEOS1120 or GEOS126 or GEOS1130)

### Corequisites

### Co-badged status

### Unit description

252 million years ago life on our planet was nearly exterminated: 96% of marine life and over 70% of terrestrial life went extinct. The causes for this mass extinction are still debated. In this unit we explore the geological history of this event. You will visit the site of the extinction boundary on a field trip and develop geological skills to understand the paleoenvironment and Earth processes that were changing at this time. You will interrogate continental reconstructions to uncover why there were glaciers near Sydney in the Permian and delve into the mantle to understand volcanoes, large igneous provinces and their devastating hazards. You will discuss how and why the magnetic field was changing at this time and investigate sediments and geochemistry to understand the link between Earth's interior and the surface. Through this analysis, we will try to understand one of the biggest questions in Earth Science: what caused the Permo-Triassic mass extinction? You will develop your skills in field work and geological mapping, rock and mineral identification in hand samples and under the microscope, viewing and probing global datasets and continent reconstructions, analysing geochemical data, and synthesising data to address scientific questions. This is a topical elective for those interested in how geoscience informs current and future environmental crises.

## 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:

**ULO3:** integrate scientific data from multiple sources to solve real-world problems and effectively communicate scientific information to experts and non-experts.

**ULO1:** observe, understand and record geological information in the field to map rocks and structures and interpret geological history including mass extinctions.

**ULO4:** develop team work, problem solving and project management skills to assess geological settings in Earth's past.

**ULO2:** identify and analyse common sedimentary, metamorphic and igneous rocks to deduce how they formed.

## General Assessment Information

Late Assessment Submission are not accepted for this unit unless a [Special Consideration](#) has been submitted and approved.

## Assessment Tasks

| Name                              | Weighting | Hurdle | Due        |
|-----------------------------------|-----------|--------|------------|
| <a href="#">Final exam</a>        | 40%       | No     | week 13    |
| <a href="#">Weekly Quizzes</a>    | 15%       | No     | every week |
| <a href="#">Literature Review</a> | 20%       | No     | 05/10/2022 |
| <a href="#">Field Report</a>      | 25%       | No     | 28/09/2022 |

### Final exam

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

Indicative Time on Task <sup>2</sup>: 17 hours

Due: **week 13**

Weighting: **40%**

Final examination that requires the application of skills and knowledge developed in this unit.

On successful completion you will be able to:

- integrate scientific data from multiple sources to solve real-world problems and

effectively communicate scientific information to experts and non-experts.

- identify and analyse common sedimentary, metamorphic and igneous rocks to deduce how they formed.

## Weekly Quizzes

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

Indicative Time on Task <sup>2</sup>: 11 hours

Due: **every week**

Weighting: **15%**

Short weekly quizzes that test knowledge of lecture and workshop material 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:

- integrate scientific data from multiple sources to solve real-world problems and effectively communicate scientific information to experts and non-experts.
- identify and analyse common sedimentary, metamorphic and igneous rocks to deduce how they formed.

## Literature Review

Assessment Type <sup>1</sup>: Literature review

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

Due: **05/10/2022**

Weighting: **20%**

A summary, interpretation or an evaluation of research findings in a field of study. See iLearn for details of the literature review.

On successful completion you will be able to:

- integrate scientific data from multiple sources to solve real-world problems and effectively communicate scientific information to experts and non-experts.

## Field Report

Assessment Type <sup>1</sup>: Case study/analysis

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

Due: **28/09/2022**

Weighting: **25%**

A report comprising multiple components that may include preparation for going in the field, field-based tasks and analysis of data collected in the field. See iLearn for details.

On successful completion you will be able to:

- integrate scientific data from multiple sources to solve real-world problems and effectively communicate scientific information to experts and non-experts.
- observe, understand and record geological information in the field to map rocks and structures and interpret geological history including mass extinctions.
- develop team work, problem solving and project management skills to assess geological settings in Earth's past.
- identify and analyse common sedimentary, metamorphic and igneous rocks to deduce how they formed.

<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

Face to Face - Workshops

## Unit Schedule

|            |   |
|------------|---|
| Workshop#1 | <b>Introduction:</b> Mass extinction events and the (violent) history of Earth  |
| Workshop#2 | <b>Geochronology</b>  |
| Workshop#3 | <b>Volcanoes and Large Igneous Provinces</b>  |
| Workshop#4 | Reading <b>Sedimentary rocks</b> (+ Anoxic Events)  |
| Workshop#5 | <b>Paleoenvironments</b> , Reconstructing paleoenvironments from sedimentary rocks  |
|            | <i>Materials for Litterature review(s) available on i-learn</i>   |
| Workshop#6 | (1) How Body <b>Fossils</b> and Trace Fossils are Formed, (2) The Geological Time Scale, and Where It Comes From, (3) <b>Biostratigraphy:</b> Defining Time Scales with Fossils |

|             |   |
|-------------|---|
| Workshop#7  | (1) Mass Extinctions in the <b>Fossil Record</b> , (2) Diversification in the Fossil Record, (3) Marine Ecosystems: The Invertebrate Fossil Record' |
| Field Work  | South Coast - 4 days (≈20-25/09/2022)   |
| Workshop#8  | <b>Impacts</b> , meteorites, relationships between the Earth and solar system object  |
| Workshop#9  | <b>Terrestrial Ecosystems</b> : Before the Dinosaurs, The Age of Dinosaurs, The Age of Mammals  |
| Workshop#10 | <b>Debate</b> - (1) What kill the dinosaure - (2) the 6th mass Extinction?  |
| Workshop#11 | <b>CO2-Atmosphere evolution and impact on the biosphere Climate</b> : Snowball Earth  |
| Workshop#12 | <b>Revision (face to face or on-line)</b>   |
| Week#13     | <b>final EXAM</b> On-Line   |

## 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](http://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 since First Published

| Date       | Description   |
|------------|---|
| 28/07/2022 | added the Late Assessment Submission section : "Late assessments are not accepted in this unit unless a Special Consideration has been submitted and approved." |