



GEOS2311

Geophysical Methods for Earth and Environmental Sciences

Session 1, Weekday attendance, North Ryde 2020

Department of Earth and Environmental Sciences

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General Information

Unit convenor and teaching staff

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Credit points

10

Prerequisites

10cp from GEOS units at 1000 level

Corequisites

Co-badged status

Unit description

Geophysical methods are the most cost-effective, environmentally safe and widely used approaches to characterise the sub-surface conditions for environmental, geotechnical, hydrogeology, engineering, archaeology and geology studies, to name a few. This unit introduces the most important geophysical methods currently used by engineers, earth and environmental scientists to understand and provide solutions to a large number of scientific and society-relevant problems (infrastructure development, groundwater contamination, geohazards, urban development, resource exploration, monitoring of pollution plumes, etc). Included are the methods of collecting and interpreting gravity, magnetic, seismic and electrical data and their use in mapping and charactering subsurface conditions. Practical classes involve reducing and interpreting geophysical data from earth and environmental problems. An excursion provides an opportunity to carry out a field survey and interpret the results in terms of geological structure and environmental aspects.

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: demonstrate a sound understanding of the basic concepts of geophysics

ULO2: operate geophysical equipment

ULO3: demonstrate an understanding of the fundamentals in modelling and interpreting geophysical data

ULO4: apply knowledge to solving geophysical problems and evaluating ideas and information

ULO5: effectively present ideas with supporting evidence

Assessment Tasks

Coronavirus (COVID-19) Update

Assessment details are no longer provided here as a result of changes due to the Coronavirus (COVID-19) pandemic.

Students should consult [iLearn](#) for revised unit information.

[Find out more about the Coronavirus \(COVID-19\) and potential impacts on staff and students](#)

General Assessment Information

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.

Delivery and Resources

Coronavirus (COVID-19) Update

Any references to on-campus delivery below may no longer be relevant due to COVID-19.

Please check here for updated delivery information: https://ask.mq.edu.au/account/pub/display/unit_status

Required and Recommended Texts and/or Materials

The textbook for the unit is MUSSETT and KHAN (Looking into the Earth, 2000). The textbook will be available from the COOP Bookshop. Copies of the PowerPoint's shown in the lectures will be available on the unit's WEB page. The recommended textbook is an excellent text for second year, but you can also consider some of the third year textbooks as well.

The texts you should first consider are DENTITH AND MUDGE (Geophysics for the Mineral Exploration Geoscientist, 2014); SHARMA (Environmental and Engineering Geophysics, 1997) and REYNOLDS (An Introduction to Applied and Environmental Geophysics, 1997), because they cover all the major geophysical topics, and are the recommended texts for the Exploration

and Environmental Geophysics I (GEOS305) unit. They have the further advantage of consistently using the SI system of units.

In the past we used a text by SHARMA (Geophysical Methods in Geology, 2nd Ed, 1986), but this is now out of print. SHARMA covers the global aspect of geophysics in more detail and is a useful reference to have if you can find a 2nd hand copy. In 1998, we used PARASNIS (Principles of Applied Geophysics, 5th Ed) but a change in publisher meant a massive increase in its cost.

However, it is a useful text to refer to if you can find a 2nd hand copy. Other useful texts to consider are; TELFORD ET AL (Exploration, fairly mathematical); KEAREY & BROOKS (Exploration, current 3rd year exploration text); FOWLER (Good solid-earth coverage, used in GEOS386); SLEEP & FUJITA (Solid-earth, more mathematical). The solid earth aspect of this unit is best covered in FOWLER. It is strongly recommended that you have access to a geophysical textbook, particularly if you are studying externally.

Technology Used and Required

The unit also has a WEB site which can be found through the iLearn WEBSITE at <https://ilearn.mq.edu.au/login/MQ/>. This site contains information such as copies of colour images, copies of PowerPoint's shown in class, and copies of the practicals that we do in class. The WEB site will also allow access to the digital version of the lectures recorded through the iLecture system. As well, this site will access the on-line quizzes that will need to be completed during the Session. At the start of the year you should be issued with a username and password (Macquarie oneID) to access all the WEB sites available for the units you have taken. This will get you into the front page of the GEOS205 WEB site.

Information for students about access to online units is available at

<https://ilearn.mq.edu.au/login/MQ/>

I recommend that you use Mozilla Firefox as your browser, as it seems to have far less problems than Internet Explorer with iLearn

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) (<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.*)

Students seeking more policy resources can visit the [Student Policy Gateway](https://students.mq.edu.au/support/study/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](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://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 help you improve your marks and take control of your study.

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)
- [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

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.