



# CIVL2201

## Soil Mechanics

Session 1, Special circumstances, North Ryde 2021

*School of Engineering*

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### Notice

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group activities on campus, and most will keep an online version available to those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face activities for your unit, please go to [timetable viewer](#). To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

## General Information

### Unit convenor and teaching staff

Convenor

Steven Hansen

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Monday 1-2pm

Lecturer

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see iLearn

Credit points

10

Prerequisites

CIVL1001

Corequisites

Co-badged status

### Unit description

This unit provides students with an introduction to engineering geology and soil mechanics. The unit presents and discusses specialised knowledge of soil mechanics that helps students undertake a variety of soil mechanics analyses through lectures and laboratory testing.

The first section on engineering geology will include an introduction to geology (minerals, rock types, rock structures), geological maps, rock evaluation and geophysical methods, and geohazards and adverse geological conditions case studies relevant to engineering applications. The second section on soil mechanics includes composition and particle sizes of the soil, physical soil states and soil classification, flow of water through soils, stresses, strains, and elastic deformation of soils, soil compaction, and soil settlement.

The main aim of this unit is to prepare students to develop fundamental knowledge required for more advanced units such as Geotechnical Engineering and Transport Engineering.

## 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 fundamental knowledge of solid Earth materials

**ULO2:** Compare different geohazards and describe their effect on construction projects

**ULO4:** Describe the behaviour and effect of flow of water through soils

**ULO3:** Describe and classify soils and determine their physical characteristics

**ULO5:** Assess the role of effective stress in soil mechanics theory and describe the strength of soils based on basic theories

## General Assessment Information

Students are expected to attend all lectures, tutorials and practicals. Recordings of lectures, tutorials and some practicals will be made available via iLearn. Attendance is **mandatory** for all practicals which are conducted in the soil mechanics lab. Please contact your convenor [steven.hansen@mq.edu.au] as soon as possible if you have difficulty attending and participating in any classes. If there are circumstances that mean you miss a practical, you can apply for a disruption to studies request through ask.mq.edu.au and if approved this practical will be removed from your record of absences.

The dates for submission of assessment tasks are listed on the iLearn schedule. Extensions for submission of assessment tasks will be given only for illness or misadventure, which must be supported by documentation through the online request portal (ask.mq.edu.au). Assessment tasks submitted late without approval will be penalized 10% of the potential total mark per day late. Students must keep a copy of their assignments. To pass this unit, students must achieve an average grade of at least 50%.

### On-line quizzes

Each week, a given problem set will be used to make sure that you have read and understood the lecture material and have successfully completed the practical and tutorial. The problem set will be administered using online quizzes through the iLearn system and together are worth 10% of the unit mark. You will do these quizzes in your own time, open book, and they will be available on Friday. They should only be attempted after completing that week's practical and tutorial. **The quizzes will close at 23:59 the following Wednesday.** There will be a time limit of between 30 mins and 90 mins depending on how much material is covered. Quizzes will include conceptual questions as well as calculations. The question order and numeric quantities are random; you will only get one chance to answer each question and you will not be able to go back to previous problems.

### Practicals and lab reports

There is an assessed practical activity each week; the schedule and details of which will be distributed via iLearn. For each practical, you must submit a written lab report which addresses the given problems/questions. Some practicals involve group work but reports are individually assessed, i.e. you must submit your own work written in your own words. Cutting and pasting information from web pages is NOT acceptable. Information you obtain from other sources (brief quotes, images, ideas) must be fully referenced in the text (author, year), with references listed at the end of the report (year, author, title, journal or link). Additionally, all work must be shown for calculation problems, including correct use of units and significant figures. Students who fail in these fundamental principles and basic skills may score zero for assignments.

Written assignments are to be submitted using Turnitin. Macquarie University promotes student awareness of information management and information ethics. As well as training and the provision of general information, the University tackles the issue of plagiarism through use of an online plagiarism detection tool (Turnitin). This software is used in conjunction with a set of procedures to ensure its use is equitable. Turnitin automatically compares your work to the work of your classmates, previous students from Macquarie University and other universities, and with material available on the Internet, both freely available and in subscription-based electronic journals and books. The results will be sent only to your unit convenor and tutors, who will analyze these in reference to the University's standard Policy on Plagiarism.

## Exams

This unit has two exams, a final and a mid-term. These examinations are based on lectures, reading material, practicals and tutorial exercises. This is information you should have absorbed through completing assignments and any other material presented during classes. A printed English dictionary (not electronic) may be brought in for the exam if English is not your first language. The educational rationale for the exam is to check the acquired knowledge by the students at the end of the unit.

The mid-term exam will be conducted during one of the scheduled lecture slots in week 7. Students are required to be present for this exam and exceptions will be given only if special consideration has been approved by the university prior to the exam. The final will occur during the normal exam period following week 13 and will be scheduled by the university. The exam timetable will be available in draft form about eight weeks before the commencement of examinations and finalized approximately four weeks before the commencement of the examinations.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<u>problem sets</u>	10%	No	weekly
<u>Practical Report</u>	20%	No	weekly
<u>Mid-session test</u>	30%	No	Week 7

Name	Weighting	Hurdle	Due
<u>Final Examination</u>	40%	No	TBD

## problem sets

Assessment Type <sup>1</sup>: Problem set

Indicative Time on Task <sup>2</sup>: 26 hours

Due: **weekly**

Weighting: **10%**

weekly problem sets

On successful completion you will be able to:

- Demonstrate a fundamental knowledge of solid Earth materials
- Compare different geohazards and describe their effect on construction projects
- Describe the behaviour and effect of flow of water through soils
- Assess the role of effective stress in soil mechanics theory and describe the strength of soils based on basic theories

## Practical Report

Assessment Type <sup>1</sup>: Lab report

Indicative Time on Task <sup>2</sup>: 12 hours

Due: **weekly**

Weighting: **20%**

Practical report based on lab work

On successful completion you will be able to:

- Compare different geohazards and describe their effect on construction projects
- Describe the behaviour and effect of flow of water through soils
- Describe and classify soils and determine their physical characteristics

## Mid-session test

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

Indicative Time on Task <sup>2</sup>: 12 hours

Due: **Week 7**

Weighting: **30%**

Mid-session test

On successful completion you will be able to:

- Demonstrate a fundamental knowledge of solid Earth materials
- Compare different geohazards and describe their effect on construction projects
- Describe and classify soils and determine their physical characteristics

## Final Examination

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

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

Due: **TBD**

Weighting: **40%**

Final examination

On successful completion you will be able to:

- Demonstrate a fundamental knowledge of solid Earth materials
- Compare different geohazards and describe their effect on construction projects
- Describe the behaviour and effect of flow of water through soils
- Describe and classify soils and determine their physical characteristics
- Assess the role of effective stress in soil mechanics theory and describe the strength of soils based on basic theories

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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

### Textbooks

The first weeks of class will use the free online textbook:

Johnson, Affolter, Inkenbrandt, and Mosher (2017). **An Introduction to Geology**. Salt Lake Community College.

Source: <https://opengeology.org/textbook/>

The Soil Mechanics section uses the text:

Holtz, Kovacs, & Sheahan (2011). **An Introduction to Geotechnical Engineering (2nd Edition)**. Pearson Higher Ed, USA. ISBN 9780135201381

The ebook can be purchased for ~\$65 from: <https://www.pearson.com.au/9780135201381>

Hardcopies can be obtained from a variety of sources.

## Unit Schedule

This unit is broken up into several modules:

- Introduction to geology (weeks 1-3)
- Soil classification and clays (weeks 4-6)
- Soil and water (week 7-8)
- Soil mechanics (weeks 9-13)

See the iLearn page for more details.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://policies.smq.edu.au) (<https://policies.smq.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](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

Students seeking more policy resources can visit [Student Policies](https://students.smq.edu.au/support/study/policies) (<https://students.smq.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)

## 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](https://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](https://ask.mq.edu.au)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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/](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

not applicable

## Changes since First Published

Date	Description
21/02/2021	office hours and passing grade added as requested

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Unit information based on version 2021.03 of the [Handbook](#)