



## UNSW Course Outline

# MINE3310 Mining Geomechanics - 2024

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## General Course Information

**Course Code :** MINE3310

**Year :** 2024

**Term :** Term 1

**Teaching Period :** T1

**Is a multi-term course? :** No

**Faculty :** Faculty of Engineering

**Academic Unit :** School of Minerals & Energy Resources Engineering

**Delivery Mode :** In Person

**Delivery Format :** Standard

**Delivery Location :** Kensington

**Campus :** Sydney

**Study Level :** Undergraduate

**Units of Credit :** 6

### Useful Links

[Handbook Class Timetable](#)

## Course Details & Outcomes

### Course Description

The course provides students with the fundamental knowledge required to undertake geomechanical investigations and design tasks. This course consists of Soil and Rock Mechanics Modules including the basics of rock and soil behaviours. Soil Mechanics Module

comprises of basic soil mechanics, soil classification, phase relationships, effective stress, seepage and flow, compaction and shallow foundations. Rock Mechanics Module consists of rock material and rock mass behaviours, rock mass strength and deformability, strength of discontinuities, basic rock testing, rock mass classification systems, response of rock mass to underground excavation, stress measurement, time dependant and dynamic behaviour of rocks.

## Course Aims

The purpose of the course is to introduce the student to methods of testing, analysis and design appropriate to structures which consist of soil and rock.

## Course Learning Outcomes

Course Learning Outcomes
CLO1 : Demonstrate a working knowledge of the engineering properties of soil and rock.
CLO2 : Differentiate appropriate methods for the design of soil slopes, retaining walls and simple foundations on soil.
CLO3 : Develop the necessary foundations in rock mechanics to embark upon a study of the principles of rock engineering.
CLO4 : Recognise the evolving nature of the discipline and develop skills to access, evaluate and integrate new knowledge and processes.

Course Learning Outcomes	Assessment Item
CLO1 : Demonstrate a working knowledge of the engineering properties of soil and rock.	<ul style="list-style-type: none"> <li>• Group Assignments in Rock &amp; Soil Mechanics</li> <li>• Workshops</li> <li>• Final Exam</li> </ul>
CLO2 : Differentiate appropriate methods for the design of soil slopes, retaining walls and simple foundations on soil.	<ul style="list-style-type: none"> <li>• Group Assignments in Rock &amp; Soil Mechanics</li> <li>• Workshops</li> <li>• Final Exam</li> </ul>
CLO3 : Develop the necessary foundations in rock mechanics to embark upon a study of the principles of rock engineering.	<ul style="list-style-type: none"> <li>• Rock Lab Work &amp; Report</li> <li>• Group Assignments in Rock &amp; Soil Mechanics</li> <li>• Workshops</li> <li>• Final Exam</li> </ul>
CLO4 : Recognise the evolving nature of the discipline and develop skills to access, evaluate and integrate new knowledge and processes.	<ul style="list-style-type: none"> <li>• Rock Lab Work &amp; Report</li> <li>• Group Assignments in Rock &amp; Soil Mechanics</li> <li>• Workshops</li> <li>• Final Exam</li> </ul>

# Learning and Teaching Technologies

Moodle - Learning Management System

## Additional Course Information

Assumed Knowledge:

CVEN2301 – Mechanics of Solids or equivalent

## Assessments

### Assessment Structure

Assessment Item	Weight	Relevant Dates
Rock Lab Work & Report Assessment Format: Individual	10%	Start Date: Not Applicable Due Date: 28/03/2024 12:00 AM
Group Assignments in Rock & Soil Mechanics Assessment Format: Group	30%	Start Date: Not Applicable Due Date: Will be scheduled during the normal lecture period in the week 7 or 9.
Workshops Assessment Format: Individual	20%	Start Date: Not Applicable Due Date: Not Applicable
Final Exam Assessment Format: Individual	40%	Start Date: Not Applicable Due Date: Formal Exam Period

## Assessment Details

### Rock Lab Work & Report

#### Assessment Overview

Students are to complete 20 pages Individual Report (specific assessment information will be provided closer to the assessment date). Marking and feedback will be provided via the Learning Management System (LMS).

#### Course Learning Outcomes

- CL03 : Develop the necessary foundations in rock mechanics to embark upon a study of the principles of rock engineering.
- CL04 : Recognise the evolving nature of the discipline and develop skills to access, evaluate and integrate new knowledge and processes.

### Group Assignments in Rock & Soil Mechanics

#### Assessment Overview

Students are required to complete 15-20 pages reports, solving practical problems and suggest

solutions (15% each).

Marking will be done with a rubric, and feedback will be provided in class during the assignment review.

#### **Course Learning Outcomes**

- CL01 : Demonstrate a working knowledge of the engineering properties of soil and rock.
- CL02 : Differentiate appropriate methods for the design of soil slopes, retaining walls and simple foundations on soil.
- CL03 : Develop the necessary foundations in rock mechanics to embark upon a study of the principles of rock engineering.
- CL04 : Recognise the evolving nature of the discipline and develop skills to access, evaluate and integrate new knowledge and processes.

#### **Assessment Length**

15-20 pages

### **Workshops**

#### **Assessment Overview**

Students require to complete a summary of 4 random selected workshop sessions (5% each)

Marking and feedback will be provided via the learning management system (LMS).

#### **Course Learning Outcomes**

- CL01 : Demonstrate a working knowledge of the engineering properties of soil and rock.
- CL02 : Differentiate appropriate methods for the design of soil slopes, retaining walls and simple foundations on soil.
- CL03 : Develop the necessary foundations in rock mechanics to embark upon a study of the principles of rock engineering.
- CL04 : Recognise the evolving nature of the discipline and develop skills to access, evaluate and integrate new knowledge and processes.

#### **Assessment information**

Note: Part of soil workshop questions will be given to students in W2 or W3. Assessments and feedback will

be provided to students within a week after submission

### **Final Exam**

#### **Assessment Overview**

3-Hour Final exam assesses content from both soil and rock mechanics.

### Course Learning Outcomes

- CL01 : Demonstrate a working knowledge of the engineering properties of soil and rock.
- CL02 : Differentiate appropriate methods for the design of soil slopes, retaining walls and simple foundations on soil.
- CL03 : Develop the necessary foundations in rock mechanics to embark upon a study of the principles of rock engineering.
- CL04 : Recognise the evolving nature of the discipline and develop skills to access, evaluate and integrate new knowledge and processes.

### Hurdle rules

Please note that a competency hurdle of 50% is applied to the final assessment.

## **General Assessment Information**

Assignments related details/submission-box will be available online through Moodle. Access to the Moodle site is via the Moodle icon on the MyUNSW homepage. For group assignments, peer assessment is required and no-completion penalty (10%) will be applied.

### Grading Basis

Standard

### Requirements to pass course

Course completion requires submission of all assessment items. Failure to submit all assessment items may result in the award of an Unsatisfactory Failure (UF) grade for the Course unless special consideration has been submitted and approved. Please note, a competency hurdle of 50% is applied to the final assessment.

## **Course Schedule**

### **Attendance Requirements**

Students are strongly encouraged to attend all classes and review lecture recordings.

### **General Schedule Information**

A detailed course schedule is provided on the Moodle.

## **Course Resources**

### **Prescribed Resources**

The University and the Faculty provide a wide range of support services for students, including:

- UNSW Learning Centre (<http://www.lc.unsw.edu.au>)

- Counselling support - <http://www.counselling.unsw.edu.au>
- Library training and support services - <http://www.library.unsw.edu.au/>

There are numerous articles / information sources on reservoir engineering on the web. Many of them are sound, but many are either very lightweight or contain errors. Be very careful in your choice of web sources. Remember, UNSW librarians are usually happy to help you locate articles or make suggestions regarding possible material to help you in your academic work. You can also access basic online help at <http://www.library.unsw.edu.au/>

## Recommended Resources

The recommended textbooks are

- R D Holtz, WD Kovacs and T C Sheahan, An Introduction to Geotechnical Engineering, Pearson
- M Budhu, Soil Mechanics and Foundations, Wiley.
- B H G Brady and E T Brown, Rock Mechanics for Underground Mining, Wiley.
- J C Jaeger, N G Cook, R Zimmerman, Fundamentals of rock mechanics, John Wiley & Sons, 2009

## Course Evaluation and Development

Online forum will be utilised to gather student feedback in addition to individual consultation scheduled for week 9 or 10, to discuss the change made by the last feedback, or further improvement.

## Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Joung Oh			293855002		No	Yes
Lecturer	Guangyao Si					No	No

## Other Useful Information

### Academic Information

#### I. Special consideration and supplementary assessment

If you have experienced an illness or misadventure beyond your control that will interfere with your assessment performance, you are eligible to apply for Special Consideration prior to, or within 3 working days of, submitting an assessment or sitting an exam.

Please note that UNSW has a Fit to Sit rule, which means that if you sit an exam, you are declaring yourself fit enough to do so and cannot later apply for Special Consideration.

For details of applying for Special Consideration and conditions for the award of supplementary assessment, please see the information on UNSW's [Special Consideration page](#).

## II. Administrative matters and links

All students are expected to read and be familiar with UNSW guidelines and policies. In particular, students should be familiar with the following:

- [Attendance](#)
- [UNSW Email Address](#)
- [Special Consideration](#)
- [Exams](#)
- [Approved Calculators](#)
- [Academic Honesty and Plagiarism](#)
- [Equitable Learning Services](#)

## III. Equity and diversity

Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course convener prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equitable Learning Services. Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.

## IV. Professional Outcomes and Program Design

Students are able to review the relevant professional outcomes and program designs for their streams by going to the following link: <https://www.unsw.edu.au/engineering/student-life/student-resources/program-design>.

*Note: This course outline sets out the description of classes at the date the Course Outline is published. The nature of classes may change during the Term after the Course Outline is published. Moodle or your primary learning management system (LMS) should be consulted for the up-to-date class descriptions. If there is any inconsistency in the description of activities between the University timetable and the Course Outline/Moodle/LMS, the description in the Course Outline/Moodle/LMS applies.*

## Academic Honesty and Plagiarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW students have a responsibility to adhere to this principle of academic integrity. Plagiarism undermines academic integrity and is not tolerated at UNSW. *Plagiarism at UNSW is defined as using the words or ideas of others and passing them off as your own.*

Plagiarism is a type of intellectual theft. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement. UNSW has produced a website with a wealth of resources to support students to understand and avoid plagiarism, visit: [student.unsw.edu.au/plagiarism](https://student.unsw.edu.au/plagiarism). The Learning Centre assists students with understanding academic integrity and how not to plagiarise. They also hold workshops and can help students one-on-one.

You are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting and the proper referencing of sources in preparing all assessment tasks.

Repeated plagiarism (even in first year), plagiarism after first year, or serious instances, may also be investigated under the Student Misconduct Procedures. The penalties under the procedures can include a reduction in marks, failing a course or for the most serious matters (like plagiarism in an honours thesis or contract cheating) even suspension from the university. The Student Misconduct Procedures are available here:

[www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf](https://www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf)

## Submission of Assessment Tasks

Work submitted late without an approved extension by the course coordinator or delegated authority is subject to a late penalty of five percent (5%) of the maximum mark possible for that assessment item, per calendar day.

The late penalty is applied per calendar day (including weekends and public holidays) that the assessment is overdue. There is no pro-rata of the late penalty for submissions made part way through a day. This is for all assessments where a penalty applies.

Work submitted after five days (120 hours) will not be accepted and a mark of zero will be



awarded for that assessment item.

For some assessment items, a late penalty may not be appropriate. These will be clearly indicated in the course outline, and such assessments will receive a mark of zero if not completed by the specified date. Examples include:

- Weekly online tests or laboratory work worth a small proportion of the subject mark;
- Exams, peer feedback and team evaluation surveys;
- Online quizzes where answers are released to students on completion;
- Professional assessment tasks, where the intention is to create an authentic assessment that has an absolute submission date; and,
- Pass/Fail assessment tasks.

## Faculty-specific Information

[Engineering Student Support Services](#) – The Nucleus - enrolment, progression checks, clash requests, course issues or program-related queries

[Engineering Industrial Training](#) – Industrial training questions

[UNSW Study Abroad](#) – study abroad student enquiries (for inbound students)

[UNSW Exchange](#) – student exchange enquiries (for inbound students)

[UNSW Future Students](#) – potential student enquiries e.g. admissions, fees, programs, credit transfer

## Phone

(+61 2) 9385 8500 – Nucleus Student Hub

(+61 2) 9385 7661 – Engineering Industrial Training

(+61 2) 9385 3179 – UNSW Study Abroad and UNSW Exchange (for inbound students)

## School-specific Information

### Course completion

Course completion requires submission of all assessment items. Failure to submit all assessment items may result in the award of an Unsatisfactory Failure (UF) grade for the Course

unless special consideration has been submitted and approved.

## **Submission of Assessment Tasks**

We encourage you to retain a copy of every assignment submitted for your own record, either in hardcopy or electronic form. All assessments must have an assessment cover sheet attached.

## **Student Resources**

The School has [student resources](#) section, containing useful advice and information to ensure you're able to focus on your studies.

## **Computing Resources and Internet Access Requirements**

UNSW Minerals and Energy Resources Engineering provides blended learning using the online Moodle LMS (Learning Management System). Also see - Transitioning to Online Learning: [www.covid19studyonline.unsw.edu.au](http://www.covid19studyonline.unsw.edu.au)

Note that some specialist engineering software is not available for Mac computers.

- Mining Engineering Students: OMB G48
- Petroleum Engineering Students: TETB LG34 & LG35

For more information about system requirements is available at [www.student.unsw.edu.au/moodle-system-requirements](http://www.student.unsw.edu.au/moodle-system-requirements)

## **Accessing Course Materials Through Moodle**

Course outlines, support materials are uploaded to Moodle, the university standard Learning Management System (LMS). In addition, on-line assignment submissions are made using the assignment dropbox facility provided in Moodle. All enrolled students are automatically included in Moodle for each course. To access these documents and other course resources, please visit: [www.moodle.telt.unsw.edu.au](http://www.moodle.telt.unsw.edu.au)

## **School Contact Information**

School of Minerals and Energy Resources  
Old Main Building, Level 1, 159 (K15)  
UNSW SYDNEY NSW 2052 AUSTRALIA

For current students, all enquiries and assistance relating to enrolment, class registration, progression checks and other administrative matters, please see [The Nucleus: Student Hub](#).

**Web & Important Links:**

[School of Minerals and Energy Resources](#)

[The Nucleus: Student Hub](#)

[Moodle](#)

[UNSW Handbook](#)

[UNSW Timetable](#)

[Student Wellbeing](#)

[Urgent Mental Health & Support](#)

[Equitable Learning Services](#)