UNSW Course Outline

MINE8760 Mine Geology and Geophysics for Mining Operations - 2024

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General Course Information

Course Code : MINE8760
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 : Online
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Postgraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

Immerse yourself in the dynamic world of Mine Geology and Geophysics for Mining Operations, a

course that bridges the critical disciplines of geology, geophysics, and mining engineering. This course provides an understanding of geology and applied geophysics within the mining engineering context, highlighting the substantial impact of geological features on mining operations. Students will explore techniques for geological assessment and gain insights into geophysical methods through real-world cases.
Moreover, this course equips students with the knowledge and skills necessary for effective communication between geological and engineering disciplines, fostering a mutually beneficial exchange of essential data. Embark on this engaging learning journey, taking your first step toward a rewarding career in the mining industry.

Course Aims

This course aims to provide mine geologists and mining engineers with an understanding of the essential interaction between the two disciplines in ongoing mining operations. The mine geologist must understand enough of the mining process to appreciate what data mining engineering needs and why it is needed. The mining engineer must understand enough about the mine geologist's roles to appreciate what support the mine geologist can provide and the data that must be gathered and interpreted to make that support possible.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Describe the mine geology and modern geophysical techniques.
CLO2 : Identify and assess short and long term information requirements - for mine feasibility, planning, construction and mine operations.
CLO3 : Apply geological and geophysical methods to estimate rock properties.
CLO4 : Assess the mine geology & geophysics practices at mines.

Course Learning Outcomes	Assessment Item
CLO1 : Describe the mine geology and modern geophysical techniques.	• Weekly quizzes and participation in discussions • Geological information and mining requirements matrices • Exercise, geophysical logs • Critical review of mine geology techniques
CLO2 : Identify and assess short and long term information requirements - for mine feasibility, planning, construction and mine operations.	• Weekly quizzes and participation in discussions • Geological information and mining requirements matrices • Critical review of mine geology techniques
CLO3 : Apply geological and geophysical methods to estimate rock properties.	• Exercise, geophysical logs • Critical review of mine geology techniques
CLO4 : Assess the mine geology & geophysics practices at mines.	• Weekly quizzes and participation in discussions • Geological information and mining requirements matrices • Critical review of mine geology techniques

Learning and Teaching Technologies

Moodle - Learning Management System | Blackboard Collaborate | Microsoft Teams

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Weekly quizzes and participation in discussions Assessment Format: Individual	20%	Start Date: Weekely from Week 1 Due Date: Two Weeks After Opening
Geological information and mining requirements matrices Assessment Format: Group	10%	Start Date: Week 1 Due Date: 17/03/2024 11:55 PM
Exercise, geophysical logs Assessment Format: Individual	20%	Start Date: Week 2 Due Date: 24/03/2024 11:55 PM
Critical review of mine geology techniques Assessment Format: Individual	50%	Start Date: Week 4 Due Date: 21/04/2024 11:55 PM

Assessment Details

Weekly quizzes and participation in discussions

Assessment Overview

The course incorporates weekly topical quizzes administered online, featuring multiple-choice questions to assess students' understanding of specific subjects. These quizzes are timed to encourage efficiency and accuracy, with results displayed instantly.

Course Learning Outcomes

- CLO1 : Describe the mine geology and modern geophysical techniques.
- CLO2 : Identify and assess short and long term information requirements - for mine feasibility, planning, construction and mine operations.
- CLO4 : Assess the mine geology & geophysics practices at mines.

Assignment submission Turnitin type

Not Applicable

Geological information and mining requirements matrices

Assessment Overview

The task entails creating matrices that explore the relationship between geological information/features and their impact on mining requirements. These matrices aim to analyse how various geological information/features influence the specific requirements for successful mining operations. They will incorporate essential data such as spatial distribution of orebody, geochemistry of mineralisation and the corresponding implications on mining method selection

and mine safety. By examining the interplay between geological information and mining requirements, these matrices enable a comprehensive understanding of how geological factors shape the specific necessities and parameters for effective mining operations. The task, to be completed as a group assignment, will require collaboration among team members. The outcome of the task will be assessed by the instructor to evaluate the group's understanding.

Course Learning Outcomes

- CLO1 : Describe the mine geology and modern geophysical techniques.
- CLO2 : Identify and assess short and long term information requirements - for mine feasibility, planning, construction and mine operations.
- CLO4 : Assess the mine geology & geophysics practices at mines.

Submission notes

One submission per group

Assignment submission Turnitin type

This is not a Turnitin assignment

Exercise, geophysical logs

Assessment Overview

This project is an individual geophysical log analysis that involves analysing various downhole geophysical measurements to gain insights into the underlying geology. The main objective is to understand the geological characteristics based on the collected data and produce a comprehensive report. The analysis will include interpreting downhole measurements, identifying geological formations, and assessing potential mineral deposits. This task allows students to focus on exploring the subject matter, developing their analytical skills, and expanding their knowledge of geology through hands-on analysis and report writing.The instructor will evaluate the report and provide feedback.

Course Learning Outcomes

- CLO1 : Describe the mine geology and modern geophysical techniques.
- CLO3 : Apply geological and geophysical methods to estimate rock properties.

Submission notes

Needs to submit both the spreadsheet and the report

Assignment submission Turnitin type

This is not a Turnitin assignment

Critical review of mine geology techniques

Assessment Overview

This major project allows students to choose between investigating and analysing "geophysical techniques and metal reserve estimation" or "geotechnical and hydrogeological techniques." Students will conduct a comprehensive study, gathering insights and producing a detailed report on their chosen topic. The report should include an explanation of the theoretical foundations of the techniques, their practical applications, relevant case studies, a critique and comparison of their feasibility, a cost-benefit analysis, and the development of a persuasive case to present to a company. This project serves as a platform for students to deepen their knowledge and refine their skills in mine geology and geophysics. The instructor will evaluate the report. The mark will be released with the final grade, and feedback will be provided upon request.

Course Learning Outcomes

- CLO1 : Describe the mine geology and modern geophysical techniques.
- CLO2 : Identify and assess short and long term information requirements - for mine feasibility, planning, construction and mine operations.
- CLO3 : Apply geological and geophysical methods to estimate rock properties.
- CLO4 : Assess the mine geology & geophysics practices at mines.

Assessment Length

Maximum of 10,000 words plus figures, tables andmaps.

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students can see Turnitin similarity reports.

General Assessment Information

Grading Basis

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 12 February - 18 February	Lecture	Overview of Mine Geology Fundamental (recorded lecture available on moodle) MS Teams Webinar on Tuesday 5:30 - 6:30 pm AEST
	Homework	Attendance in online forum and discuss this week materials as explained on moodle Take Part in the Weekly Quiz Start Working on Group Assignment (Geological information and mining requirements matrices)
Week 2 : 19 February - 25 February	Lecture	Geophysical Investigations - Downhole Logging (recorded lecture available on moodle) MS Teams Webinar on Tuesday 5:30 - 6:30 pm AEST
	Homework	Attendance in online forum and discuss this week materials as explained on moodle Take Part in the Weekly Quiz Continue Working on Group Assignment (Geological information and mining requirements matrices) Start Working on Individual Assignment (Geophysical logs exercise)
Week 3 : 26 February - 3 March	Lecture	Geophysical Investigations - Airborne Geophysics (recorded lecture available on moodle) MS Teams Webinar on Tuesday 5:30 - 6:30 pm AEST
	Homework	Attendance in online forum and discuss this week materials as explained on moodle Take Part in the Weekly Quiz Continue Working on Group Assignment (Geological information and mining requirements matrices) Continue Working on Individual Assignment (Geophysical logs exercise)
Week 4 : 4 March - 10 March	Lecture	Mineral Exploration, and Seismicity and Stresses (recorded lecture available on moodle) MS Teams Webinar on Tuesday 5:30 - 6:30 pm AEST
	Homework	Attendance in online forum and discuss this week materials as explained on moodle Take Part in the Weekly Quiz Continue Working on Group Assignment (Geological information and mining requirements matrices) Continue Working on Individual Assignment (Geophysical logs exercise) Start Working on Individual Major Project (Critical review of mine geology OR geophysics practices at a selected mine)
Week 5 : 11 March - 17 March	Lecture	Ore Deposits (recorded lecture available on moodle) MS Teams Webinar on Tuesday 5:30 - 6:30 pm AEST
	Homework	Attendance in online forum and discuss this week materials as explained on moodle Take Part in the Weekly Quiz Submit Group Assignment (Geological information and mining requirements matrices) on 7 March, 11:55 PM Continue Working on Individual Assignment (Geophysical logs exercise) Continue Working on Individual Major Project (Critical review of mine geology OR geophysics practices at a selected mine)
Week 6 : 18 March - 24 March	Lecture	Mine Hydrogeology (recorded lecture available on moodle) MS Teams Webinar on Tuesday 5:30 - 6:30 pm AEST
	Homework	Attendance in online forum and discuss this week materials as explained on moodle Take Part in the Weekly Quiz Submit Individual Assignment (Geophysical logs exercise) on 24 March, 11:55 PM Continue Working on Individual Major Project (Critical review of mine geology OR geophysics practices at a selected mine)
Week 7 : 25 March - 31 March	Other	Additional Lectures (recorded lecture available on moodle) MS Teams Webinar on Tuesday 5:30 - 6:30 pm AEST
	Homework	Continue Working on Individual Major Project (Critical review of mine geology OR geophysics practices at a selected mine) and submit on 21 April, 11:55 PM

Attendance Requirements

Students must watch recorded lectures. Students are highly encouraged to actively participate in all webinars.

Additionally, attendance is mandatory for the industry guest presentation, which will be announced and detailed on the Moodle platform.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Hamed Lamei Ramandi		Room 156, 1st Floor, Old Main Building, UNSW Sydney, NSW 2052, Australia	+61 (2) 9065 7310		Yes	Yes

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 polices. 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 Plagarism

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. 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

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

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

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

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