MINE4260

Coal Mine Design and Feasibility Project

Term 2, 2022
Course Overview

Staff Contact Details

Convenors

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Availability</th>
<th>Location</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serkan Saydam</td>
<td><a href="mailto:s.saydam@unsw.edu.au">s.saydam@unsw.edu.au</a></td>
<td>During the class session times</td>
<td>Kensington</td>
<td>93854525</td>
</tr>
<tr>
<td>Chengguo Zhang</td>
<td><a href="mailto:chengguo.zhang@unsw.edu.au">chengguo.zhang@unsw.edu.au</a></td>
<td>During the class session times</td>
<td>159</td>
<td></td>
</tr>
</tbody>
</table>

School Contact Information

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

Engineering Student Services
E: mere.teaching@unsw.edu.au
W: www.engineering.unsw.edu.au/minerals-energy-resources
Course Details

Units of Credit 6

Summary of the Course

In this course a potential coal project will be evaluated from the perspective of open cut and underground mining. The course will integrate the technical, economic, and management content presented earlier in the mining engineering program in the design and evaluation of a new mining project while taking account of industry standards, community expectations and government requirements. Technical design, project evaluation and assessment of the socio-political impacts of the project are a core focus of the course. Due to the scope of work involved, the project is undertaken by teams of students. The teams are required to prepare and present a feasibility study of a mining project. Teamwork, project management and presentations skills are assessed in addition to the technical analysis and content of the final feasibility study.

On completion of the course, the student should be capable of demonstrating an understanding of:

- methodologies to evaluate the viability and risks associated with metalliferous mining projects;
- range of software tools to assist in design, scheduling, modelling and evaluation of a metalliferous mining project;
- the theoretical principles and practical methodologies associated with mine planning and feasibility study projects;
- appreciation of the sustainability aspects of mining;
- technical writing and oral communication skills; and
- management of project work by teams.

Course Aims

The aim of this course is to assist students carry out a pre-feasibility study on a coal deposit incorporating:

- Reserve estimation,
- Mining method selection,
- Mine design and optimisation,
- Development and production planning/scheduling,
- Equipment selection,
- Geomechanics,
- Ventilation,
- Cost analysis,
- Economic evaluation.

In addition, there may be a number of topics of special focus for a given project such as environmental factors, environmental impact/design and social responsibility. The project will be undertaken in the spirit of a pre-feasibility study to determine its economical viability using standard engineering economic methods of project evaluation.

Course Learning Outcomes

After successfully completing this course, you should be able to:
<table>
<thead>
<tr>
<th>Learning Outcome</th>
<th>EA Stage 1 Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assess the feasibility of a mining project with consideration to: Data analysis and interpretation Mine layout Development and production planning/scheduling/Staffing, Equipment selection, Geotechnical, technical, environmental and economical factors Ventilation Economical factors including mining costs, commodity market, etc. Social and environmental impact Project risk analysis Mine closure/rehabilitation</td>
<td>PE1.1, PE1.2, PE1.3, PE1.4, PE1.5, PE1.6, PE2.1, PE2.2, PE2.3, PE2.4, PE3.6</td>
</tr>
<tr>
<td>2. Demonstrate team skills in the management of a project work</td>
<td>PE3.1, PE3.2, PE3.4, PE3.5, PE3.6</td>
</tr>
<tr>
<td>3. Demonstrate advanced written and oral communication skills</td>
<td>PE3.1, PE3.2, PE3.4, PE3.6</td>
</tr>
</tbody>
</table>

**Teaching Strategies**

Please refer to the information in Moodle
Assessment

<table>
<thead>
<tr>
<th>Assessment task</th>
<th>Weight</th>
<th>Due Date</th>
<th>Course Learning Outcomes Assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Progress Interview 1</td>
<td>10%</td>
<td>20/06/2022 10:00 AM</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>2. Progress Interview 2</td>
<td>15%</td>
<td>Week 9</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>3. Final Report</td>
<td>50%</td>
<td>Study Week</td>
<td>1, 2, 3</td>
</tr>
<tr>
<td>4. Final Presentation</td>
<td>25%</td>
<td>Week 10</td>
<td>1, 2, 3</td>
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</tbody>
</table>

Assessment 1: Progress Interview 1

Start date: 30/05/2022 09:00 AM  
Submission notes: No submission is required, Teams or Face-to-Face meeting is required  
Due date: 20/06/2022 10:00 AM

This task includes the designing and optimising the open cut coal mining. This will also include demonstrating the knowledge of MINEX software use. PI1 will be conducted in front of a computer (online or face-to-face) with a Q&A session on the progress of the work conducted by the group.

Assessment criteria

TBA

Assessment 2: Progress Interview 2

Start date: 30/05/2022 10:00 AM  
Submission notes: No submission is required, Teams meeting is required  
Due date: Week 9

This task includes the designing and optimising the underground coal mining. This will also include demonstrating the knowledge of MINEX software use. PI2 will be conducted in front of a computer (online or face-to-face) with a Q&A session on the progress of the work conducted by the group.

Assessment criteria

TBA

Assessment 3: Final Report

Start date: 30/05/2022 09:00 AM  
Submission notes: pdf or word doc with excel financial technical model  
Due date: Study Week

A report writing based on a pre-feasibility study expectations similar to MINE 4250

Assessment 4: Final Presentation
**Submission notes:** Students need to present to the Board (30 min presentation by each group followed by Q&A).

**Due date:** Week 10

This is Board Presentation presented to the industry reps. 30 min presentation followed by a Q&A session.
### Attendance Requirements

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

### Course Schedule

There will be no specific lectures for this course. However, there will be group meetings, software training sessions and industry workshops.

[View class timetable](#)

### Timetable

<table>
<thead>
<tr>
<th>Date</th>
<th>Type</th>
<th>Content</th>
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<tbody>
<tr>
<td>Week 1: 30 May - 3 June</td>
<td>Presentation</td>
<td>Course Introduction</td>
</tr>
<tr>
<td></td>
<td>Project</td>
<td>Review of resource model and data manipulation.</td>
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<tr>
<td></td>
<td>Tutorial</td>
<td>MINEX training online - 30th May 2022 from 11.30 am until 6 pm</td>
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<tr>
<td></td>
<td></td>
<td>MINEX training online - 3rd June 2022 from 10.00 am until 5 pm</td>
</tr>
<tr>
<td>Week 2: 6 June - 10 June</td>
<td>Project</td>
<td>Pit Optimisation work continues</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pit Design work commences</td>
</tr>
<tr>
<td></td>
<td>Lecture</td>
<td>Industry Presentation - TBC</td>
</tr>
<tr>
<td>Week 3: 13 June - 17 June</td>
<td>Project</td>
<td>Open Cut Design work continues - Design of mine development and access. Production rates and production scheduling for open cut mine.</td>
</tr>
<tr>
<td></td>
<td>Workshop</td>
<td>Industry Workshop - TBC</td>
</tr>
<tr>
<td>Week 4: 20 June - 24 June</td>
<td>Assessment</td>
<td>Progress Interview 1</td>
</tr>
<tr>
<td></td>
<td>Assessment</td>
<td>Progress Interview 1: No submission is required, Teams or Face-to-Face meeting is required</td>
</tr>
<tr>
<td>Week 5: 27 June - 1 July</td>
<td>Project</td>
<td>Underground design and layout.</td>
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<tr>
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<td>Equipment Selection and Production Scheduling.</td>
</tr>
<tr>
<td>Week 6: 4 July - 8 July</td>
<td>Project</td>
<td>Finalise your open cut and continue working on underground design.</td>
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</tbody>
</table>
| Week 7: 11 July - 15 July | Project | Finalise underground mine design (Fleet size, capacity, type, etc.).
Ventsim simulation, ground support design, etc. |
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<tbody>
<tr>
<td>Workshop</td>
<td>Industry Workshop - TBC</td>
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</tbody>
</table>
| Week 8: 18 July - 22 July | Project | Finalise open cut and underground mine design and surface infrastructure
Cost estimation and economic evaluation
Sustainable development
Capital and operating costs, production costs, sensitivity analysis, NPV, etc.
Risk analysis, environmental and social impacts, mine closure, etc. |
| Workshop | Industry workshop - review of designs - TBC |
| Week 9: 25 July - 29 July | Assessment | Progress Interview 2 |
Assessment | Progress Interview 2: No submission is required, Teams meeting is required |
| Week 10: 1 August - 5 August | Project | Finalise the project work |
Presentation | Dry Run |
Assessment | Final Presentation: Students need to present to the Board (30 min presentation by each group followed by Q&A). |
| Study Week: 8 August - 11 August | Seminar | Industry Presentation |
Assessment | Final Report: pdf or word doc with excel financial technical model |
Resources

Recommended Resources

Support material for this course including, whenever available, copies of lecture notes, recommended readings, assignments and results for assignments etc can be found on Moodle. All correspondence with students and any information regarding changes in the lecture schedule and assignment dates will be done through Moodle. All assignments must be submitted through Moodle. It is important that students regularly check Moodle for changes in calendar events and for messages.

- MEA Report Writing Guide for Mining Engineers. P Hagan and P Mort (Mining Education Australia (MEA)). (Latest edition available for download from the School website or a hardcopy version is available from the UNSW Bookshop)
- Guide to Authors. (Australasian Institute of Mining and Metallurgy: Melbourne) (Available for download from the AusIMM website)

Course Evaluation and Development

Weekly meetings will be organised for each group during the course time

Each assessment will have peer review

Laboratory Workshop Information

Series of Software tutorials will be arranged with Maptek - Vulcan

Maptek will also organise online training videos

Series indurtry workshop will be organised.
Submission of Assessment Tasks

The School has developed a guideline to help you when submitting a course assignment.

We encourage you to retain a copy of every assignment submitted for assessment for your own record either in hardcopy or electronic form.

All assessments must have an assessment cover sheet attached.

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.

Late Submission of an Assessment

Full marks for an assessment are only possible when an assessment is received by the due date. 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. 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 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, or
- Online quizzes where answers are released to students on completion, or Professional assessment tasks, where the intention is to create an authentic assessment that has an absolute submission date, or Pass/Fail assessment tasks.

We understand that at times you may not be able to submit an assignment on time, and the School will accommodate any fair and reasonable extension. We would recommend you review the UNSW Special Consideration guidelines – see section below.

Special Consideration

You can apply for special consideration through The Nucleus Student Hub when illness or other circumstances interfere with your assessment performance. Sickness, misadventure or other circumstances beyond your control may:

- Prevent you from completing a course requirement
- Keep you from attending an assessable activity
- Stop you submitting assessable work for a course
- Significantly affect your performance in assessable work, be it a formal end-of-semester
examination, a class test, a laboratory test, a seminar presentation or any other form of assessment

We ask that you please contact the Course Convenor immediately once you have completed the special consideration application, no later than one week from submission.

More details on special consideration can be found at: www.student.unsw.edu.au/special-consideration

**Student Support**

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

- Library training and support services - www.library.unsw.edu.au
- UNSW Learning Centre - www.lc.unsw.edu.au
- Counselling support - www.counselling.unsw.edu.au

**Equitable Learning Services** aims to provide all students with a free and confidential service that provides practical support to ensure that your health condition doesn't adversely affect your studies. https://student.unsw.edu.au/els
Academic Honesty and Plagiarism

Your lecturer and the University will expect your submitted assignments are truly your own work. UNSW has very clear guidelines on what plagiarism is and how to avoid it. Plagiarism is using the words or ideas of others and presenting them 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. The University has adopted an educative approach to plagiarism and has developed a range of resources to support students. All the details on plagiarism, including some useful resources, can be found at [www.student.unsw.edu.au/plagiarism](http://www.student.unsw.edu.au/plagiarism).

All MERE students are required to complete a student declaration for academic integrity which is outlined in the assignment cover sheets. By signing this declaration, you agree that your work is your own original work.

If you need some additional support with your writing skills, please contact the Learning Centre or view some of the resources on their website: [www.lc.unsw.edu.au](http://www.lc.unsw.edu.au). The Learning Centre is designed to help you improve your academic writing and communication skills. Some students use the Centre services because they are finding their assignments a challenge, others because they want to improve an already successful academic performance.
Academic Information

Course Results

For details on UNSW assessment policy, please visit: www.student.unsw.edu.au/assessment

In some instances your final course result may be withheld and not released on the UNSW planned date. This is indicated by a course grade result of either:

- LE – indicates you have not completed one or more items of assessment; or
- WD – indicates there is an issue with one or more assignment; or
- WC – which indicates you have applied for Special Consideration due to illness or misadventure and the course results have not been finalised.

In either event it would be your responsibility to contact the Course Convener as soon as practicable but no later than five (5) days after release of the course result. If you don’t contact the convener on time, you may be required to re-submit an assignment or re-sit the final exam and may result in you failing the course. You would also have a NC (course not completed) mark on your transcript and would need to re-enroll in the course.

Studying a course in the School of Minerals and Energy Resources Engineering at UNSW

Report writing guide

The School has a Report Writing Guide (RWG) available. A copy of this is available on the course Moodle site.

Computing Resources and Internet Access Requirements

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

It is essential that you have access to a PC or notebook computer. Mobile devices such as smart phones and tablets may compliment learning, but access to a PC or notebook computer is also required. Note that some specialist engineering software is not available for Mac computers.

- Mining Engineering Students: OMB G48
- Petroleum Engineering Students: TETB LG34 & LG 35

It is recommended that you have regular internet access to participate in forum discussion and group work. To run Moodle most effectively, you should have:
• broadband connection (256 kbit/sec or faster)
• ability to view streaming video (high or low definition UNSW TV options)

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

This course outline sets out 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 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 (as updated in Moodle), the description in the Course Outline/Moodle applies.

How We Contact You

At times, the School or your course convenors may need to contact you about your course or your enrolment. Your course convenors will use the email function within Moodle or we will contact you on your @student.unsw.edu.au email address.

We understand that you may have an existing email account and would prefer for your UNSW emails to be redirected to your preferred account. Please see instructions on how to redirect your UNSW emails: "How can I forward my emails to another account?"

How You Can Contact Us

We are always ready to assist you with your inquiries. To ensure your question is directed to the correct person, please use the email address below for:

• Enrolment or other admin questions regarding your program: https://unswinsight.microsoftcrmportals.com/web-forms/
• Course inquiries should be directed to the Course Convenor.

Image Credit

Synergies in Sound 2016

CRICOS

CRICOS Provider Code: 00098G
Acknowledgement of Country

We acknowledge the Bedegal people who are the traditional custodians of the lands on which UNSW Kensington campus is located.
## Appendix: Engineers Australia (EA) Professional Engineer Competency Standard

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<thead>
<tr>
<th>Program Intended Learning Outcomes</th>
</tr>
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<tbody>
<tr>
<td>Knowledge and skill base</td>
</tr>
<tr>
<td>PE1.1 Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline</td>
</tr>
<tr>
<td>PE1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline</td>
</tr>
<tr>
<td>PE1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline</td>
</tr>
<tr>
<td>PE1.4 Discernment of knowledge development and research directions within the engineering discipline</td>
</tr>
<tr>
<td>PE1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline</td>
</tr>
<tr>
<td>PE1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline</td>
</tr>
<tr>
<td>Engineering application ability</td>
</tr>
<tr>
<td>PE2.1 Application of established engineering methods to complex engineering problem solving</td>
</tr>
<tr>
<td>PE2.2 Fluent application of engineering techniques, tools and resources</td>
</tr>
<tr>
<td>PE2.3 Application of systematic engineering synthesis and design processes</td>
</tr>
<tr>
<td>PE2.4 Application of systematic approaches to the conduct and management of engineering projects</td>
</tr>
<tr>
<td>Professional and personal attributes</td>
</tr>
<tr>
<td>PE3.1 Ethical conduct and professional accountability</td>
</tr>
<tr>
<td>PE3.2 Effective oral and written communication in professional and lay domains</td>
</tr>
<tr>
<td>PE3.3 Creative, innovative and pro-active demeanour</td>
</tr>
<tr>
<td>PE3.4 Professional use and management of information</td>
</tr>
<tr>
<td>PE3.5 Orderly management of self, and professional conduct</td>
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<tr>
<td>PE3.6 Effective team membership and team leadership</td>
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</table>

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