MINE8120

Hazard Identification, Risk and Safety Management in Mining

Term 1, 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>Chengguo Zhang</td>
<td><a href="mailto:chengguo.zhang@unsw.edu.au">chengguo.zhang@unsw.edu.au</a></td>
<td>Moodle, Teams, Email</td>
<td>School of Minerals and Energy Resources Engineering OMB, 159E</td>
<td>+61 2 9385 4035</td>
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</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

The aim of this course is to provide students with an appreciation of the broad range of risks faced by a mining operation, for which a dynamic range of risk management strategies are required - from feasibility, planning and design, through to normal operations. These include economic risks, geological risks, environmental risks, external factors and influences, and of course health and safety risks. The module will introduce students to the processes of hazard identification, risk assessment, and a number of risk management strategies available. In the context of mining hazards and safety related risks, the course will also review a number of generic mine safety factors and how these manifest themselves in different mining systems and methods of mining.

Course Aims

This course aims to equip the student with knowledge and skills in risk and safety management in the mining industry.

Course Learning Outcomes

1. Demonstrate a broad awareness of the wide range of risks that affect and are involved in the mining industry, and how these risks are managed.
2. Assess the major risk assessment techniques available and in use in the industry, and be capable of conducting a simple risk assessment process.
3. Identify the core risks associated with major mining methods.
4. Recognise the generic mine safety factors and hazards that exist or have potential to exist in mining operations, and demonstrate an awareness of how these are or can be dealt with.

This course will contribute to the development of the following Graduate Attributes:

1. appropriate technical knowledge
2. having advanced problem solving, analysis and synthesis skills with the ability to tolerate ambiguity
3. ability for engineering design and creativity
4. awareness of opportunities to add value through engineering and the need for continuous improvement
5. being able to work and communicate effectively across discipline boundaries
6. having HSEC consciousness
7. being active life-long learners.

Teaching Strategies

The course is run online over 7 weeks with the following schedule:

Week 1
Presentations, reading,

Introduction to Risk Management

Week 2

Presentations, reading, quiz

Mining technical and economic risks

Week 3

Presentations, reading

Mine safety risks - the fundamentals

Week 4

Presentations, reading, quiz

Mine safety risks - advanced concepts

Week 5

Presentations, reading

Avoiding organizational accidents

Week 6

Presentations, reading, quiz

Sustainability risks

Week 7

Complete major assignment & submit

Additional Course Information

This course assumes a student has knowledge of
• basic mining and geological terms and descriptions
• mining systems
## 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. Online Quizzes</td>
<td>60%</td>
<td>End of Wks 1-6</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>2. Individual report</td>
<td>25%</td>
<td>14/03/2022 10:00 AM</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>3. Individual report</td>
<td>15%</td>
<td>04/04/2022 10:00 AM</td>
<td>1, 2, 3, 4</td>
</tr>
</tbody>
</table>

### Assessment 1: Online Quizzes

**Start date:** Start of Wks 1-6  
**Due date:** End of Wks 1-6

6 sets of quizzes are included for 6 weeks.

### Assessment 2: Individual report

**Due date:** 14/03/2022 10:00 AM

Investigation of a major mining incident

### Assessment 3: Individual report

**Due date:** 04/04/2022 10:00 AM

Risks of mining in developing countries
Attendance Requirements

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

Course Schedule

View class timetable

Timetable

<table>
<thead>
<tr>
<th>Date</th>
<th>Type</th>
<th>Content</th>
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</thead>
<tbody>
<tr>
<td>Week 1: 14 February - 18 February</td>
<td>Presentation</td>
<td>Introduction to Risk Management&lt;br&gt;Corporate attitudes to risk&lt;br&gt;Types of Mining Risks&lt;br&gt;Laws relating to RA and safety</td>
</tr>
<tr>
<td>Week 2: 21 February - 25 February</td>
<td>Presentation</td>
<td>Safety and risk management&lt;br&gt;Risk assessment tools&lt;br&gt;Scoping a RA&lt;br&gt;Safety in Mines - Perceptions and realities&lt;br&gt;Challenger video&lt;br&gt;Challenger - the causes&lt;br&gt;Columbia - another space shuttle incident&lt;br&gt;Piper Alpha video</td>
</tr>
<tr>
<td>Week 3: 28 February - 4 March</td>
<td>Presentation</td>
<td>Managing safety in Australian Coal Mines&lt;br&gt;Human factors engineering&lt;br&gt;Humans in the Work Environment&lt;br&gt;Human behaviours&lt;br&gt;Control strategies</td>
</tr>
<tr>
<td>Week 4: 7 March - 11 March</td>
<td>Presentation</td>
<td>Australian incidents&lt;br&gt;Northparkes module&lt;br&gt;International incidents&lt;br&gt;Vaals reef video&lt;br&gt;How to avoid the disasters&lt;br&gt;Safe work behaviours - a model</td>
</tr>
<tr>
<td>Week 5: 14 March - 18 March</td>
<td>Presentation</td>
<td>Exploration and geological risks&lt;br&gt;Economic and project risks in mining&lt;br&gt;Case study: New Caledonia Nickel&lt;br&gt;Mining methods - Core risks&lt;br&gt;Inrush risk&lt;br&gt;Mine ventilation - a core risk&lt;br&gt;Mineral processing risks</td>
</tr>
<tr>
<td>Week 6: 21 March - 25 March</td>
<td>Presentation</td>
<td>Sustainable mining practices&lt;br&gt;Environmental risks&lt;br&gt;The resource curse&lt;br&gt;Sovereign and governance risks&lt;br&gt;Why do Mines Close</td>
</tr>
<tr>
<td>Mine closure risks</td>
<td>Case study: Gold mining in Fiji</td>
<td>Case study: Uranium mining</td>
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| Week 7: 28 March - 1 April | Assessment | Complete major assignment & submit |
Resources

Prescribed Resources

Resources available on Moodle

Course Evaluation and Development

At the end of each course, all students will have the opportunity to complete a course evaluation form. These anonymous surveys help us understand your views of the course, your lecturers and the course materials. We are continuously improving our courses based on student feedback, and your perspective is valuable.

Feedback is given via https://student.unsw.edu.au/myexperience and you will be notified when this is available for you to complete.

We also encourage all students to share any feedback they have any time during the course – if you have a concern, please contact us immediately.
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. Please note, a competency hurdle of 50% is applied to the final assessment.

Late Submission of an Assignment

Full marks for an assignment are only possible when an assignment is received by the due date.

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.

Late submission will not be accepted and will be considered as no submission.

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
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.

All Mining Engineering 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. 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](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)

## 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.microsoftcrmportalss.com/web-forms/](https://unswinsight.microsoftcrmportalss.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.
ACADEMIC REQUIREMENTS
Before submitting this assignment, the student is advised to review:

- the assessment requirements contained in the briefing document for the assignment;
- the various matters related to assessment in the relevant Course Outline; and
- the Plagiarism and Academic Integrity website at <http://www.lc.unsw.edu.au/plagiarism/pintro.html> to ensure they are familiar with the requirements to provide appropriate acknowledgement of source materials.

If after reviewing this material there is any doubt about assessment requirements, then in the first instance the student should consult with the Course Convenor and then if necessary with the Director – Undergraduate Studies.

While students are generally encouraged to work with other students to enhance learning, all assignments submitted for assessment must be their entire own work and duly acknowledge the use of other person’s work or material. The student may be required to explain any or all parts of the assignment to the Course Convenor or other authorised persons. Plagiarism is using the work of others in whole or part without appropriate acknowledgement within the assignment in the required form. Collusion is where another person(s) assists in the preparation of a student’s assignment without the consent or knowledge of the Course Convenor.

Plagiarism and Collusion are considered as Academic Misconduct and will be dealt with according to University Policy.

STUDENT DECLARATION OF ACADEMIC INTEGRITY
I declare that:

- This assessment item is entirely my own original work, except where I have acknowledged use of source material [such as books, journal articles, other published material, the Internet, and the work of other student/s or any other person/s].
- This assessment item has not been submitted for assessment for academic credit in this, or any other course, at UNSW or elsewhere.

I understand that:

- The assessor of this assessment item may, for the purpose of assessing this item, reproduce this assessment item and provide a copy to another member of the University.
- The assessor may communicate a copy of this assessment item to a plagiarism checking service (which may then retain a copy of the assessment item on its database for the purpose of future plagiarism checking).

Student Signature: ___________________________ Date: ___________________________

Students are advised to retain a copy of this assessment for their records and submission should be made in accordance to the assessment details available on the course Moodle site.