



Faculty of Engineering

School of Minerals and Energy Resources Engineering

Postgraduate Course Outline

MINE8120 – 6UOC

Hazard and Risk Identification (Distance mode)

T1, 2020

Associate Professor David Laurence

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1. INFORMATION ABOUT THE COURSE

Course Code:	MINE8120	Term:	T1, 2019	Level:	PG	Units/Credits	6 UOC
Course Name:	Hazard and Risk Identification						

Course Convenor:	A/ Professor David Laurence						
Contact Details	School of Minerals and Energy Resources Engineering Old Main Building, Room G36	EMAIL:	d.laurence@unsw.edu.au				
		Phone:					
Contact times	Contact times are scheduled online over seven weeks.						

1.1. Course Description

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.

1.2. Course Completion

Course completion requires:

- submission of **all assessment items**; failure to submit all assessment items will result in the award of an Unsatisfactory Failure (UF) grade for the Course.

1.3. Assumed Knowledge

This course assumes a student has knowledge of

- as this is a technical course in a postgraduate program, a fundamental understanding of both Mathematics and Physics to a standard at least equivalent to a first year course in a university engineering program
- basic mining and geological terms and descriptions
- mining systems

2. AIMS, LEARNING OUTCOMES AND GRADUATE ATTRIBUTES

2.1. Course Aims

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

2.2. Learning Outcomes

It is intended that students who successfully complete this course will be able to:

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.

2.3. Graduate Attributes

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.

3. REFERENCE RESOURCES

3.1. Reference Materials

- *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)

3.2. Online Resources

There are significant resources available in the LTMS including a learning guide; presentations; course reader; video clips etc.

4. COURSE CONTENT AND LEARNING ACTIVITIES

4.1. Learning Activities Summary

The Learning Guide is designed to guide you through the course content and activities, week by week. Apart from the learning guide, the package of resource material available to you includes a course reader, presentations, and video clips.

UNSW Week	Week Starting	Hrs.	Topic	Content/Activities
1	2 March	15	Introduction to Risk Management	1.1 Course introduction/expectations
				1.2 Types of Mining Business Risks
				1.3 The Regulatory Environment
				Presentations, reading
2	9 Mar	15	Mining technical and economic risks	2.1 Geological risks; project risks; ventilation risks; environmental risks
				Presentations, reading, quiz
3	16 Mar	15	Mine safety risks – the fundamentals	3.1 Concepts; Piper Alpha; Challenger, Columbia; Numerical risk analysis
				Presentations, reading
4	23 Mar	15	Mine safety risks – advanced concepts	4.1 Human factors; human behaviour; geotechnical risks; inrush risks;
				Presentations, reading, quiz
5	30 Mar	15	Avoiding organizational accidents	5.1 Corporate initiatives; avoiding mine disasters - theory and practice
				Presentations, reading
6	6 April	15	Sustainability risks	6.1 Environmental risks; Social and community risks;
				Presentations, reading, quiz
7	13 April		Complete final assignment	

Total student effort hours: Approx. 100-150

(Note: The above indication of “student effort hours” is indicative only – It reflects the anticipated level of total student involvement with the course – either through accessing or participating in online materials and activities; private research; preparation of assignments. Individual students may find their level of involvement differs from this schedule.)

5. COURSE ASSESSMENT

5.1. Assessment Summary

Assessment of the research project is based on the submissions made at various project milestones over the course of the year.

All assessments are due 12 midnight Sydney time, unless otherwise indicated in the table below.

Assessment task	Due date	Release date	Weight	Assessment	Learning outcomes assessed
A1.0	End of Wks. 2,4,6	Start of Wks. 2,4,6	15% x3	Online quizzes - 10 questions	1,2,3,4
A2.0	5 Apr	8 Mar	25%	Individual report - Investigation of a major mining incident	1,2,3,4
A3.0	19 April	22 Mar	30%	Individual report - Risks of mining in developing countries	1,2,3,4

All the course materials and assignments will be available online through Moodle. Access to the Moodle site is via the Moodle icon on the MyUNSW homepage, or at <https://moodle.telt.unsw.edu.au>

5.2. Assessment Requirements

When

- If not otherwise stated, **the default deadline for submission of an assignment is 12 midnight Sunday in the nominated week.**
- Prior to submission, students should read the School Policy on *Assignment Submissions* which can be viewed at: < www.mining.unsw.edu.au/information-about/our-school/policies-procedures-guidelines >.
- In particular, the student should make sure they have read and understood the:
 - Declaration of Academic Integrity;
 - Assignment Submission requirements detailed in the *University Policies* section of the Course Outline; and
 - School Policy on *Assignment Submission* available on the School's website (the web address is given in the Course Outline). In particular note the requirement that only PDF documents should be uploaded and the required file naming convention.

Where

- *Submissions must be made electronically* through Turnitin in the LTMS unless otherwise stated. Turnitin is a plagiarism checking service that will retain a copy of the assessment item on its database for the purpose of future plagiarism checking.
- For more guidance on Turnitin: <https://student.unsw.edu.au/turnitin>

What

- The submission must be:
 - a single document in PDF format; and
 - prepared in the form of a formal report that includes a list of reference sources cited in the report, prepared in accordance with the report writing standards of the School as contained in the **MEA Report Writing Guide for Mining Engineers**. A copy can be obtained from the UNSW Bookshop or downloaded from the School webpage.
- Each submission must have appended:
 - to the front, a signed copy of the Student Declaration Form and Coversheet; and
 - to the end, a completed self-assessed copy of the Assessment Criteria.Copies of both documents are available for download from LTMS.
- It is **strongly recommended** when preparing the major assignment; students use the **Report Template** available from LTMS. Note: as this template already incorporates the required the Student Declaration Form, a student does not need to separately append a signed copy of coversheet to their assignment.

How

- The submitted document must be consistent with the following file naming convention: < FamilyNameInitials_CourseCode_AssignmentNumber.pdf >.
- A typical compliant filename would take the following form < SmithPD_MINE8120_A01.pdf > which elements correspond to:
 - Family name of student: Smith
 - Initial(s) of student: PD
 - Course Code: MINE8120
 - Assignment number: A01...as defined in the Course Outline for the assessment task
 - File format: PDF document

5.3. Penalties for Non-Compliant Submission

A submission that is non-compliant with the School Policy on *Assignment Submission* and/or requirements as contained in this Course Outline may not be marked and/or penalty marks subtracted from the assignment mark for non-compliance.

Some examples of a non-compliant assignment include that the assignment submission:

- is not a single PDF document. *Penalty for non-compliance:* assignment not marked.
- does not contain a signed copy of the *Student Declaration Statement*. *Penalty for non-compliance:* assignment not marked.
- is not fully consistent with the designated file naming convention as listed above and defined as Item #6 in the School Policy on electronic submission. For example, a file name such as < ProjectProposal.pdf > is NOT compliant.

6. ASSESSMENT CRITERIA

The criteria listed for each item of assessment and the descriptions contained therein are not intended to be prescriptive nor is it an exhaustive list. Rather it should be viewed as a framework to guide the student as to the type of information and depth of coverage that is expected to be evident in a submission for assessment; the framework illustrates for example what would distinguish an excellent achievement from a poor achievement.

The student should be cognisant that a range of factors is often being assessed in any one assignment; not just whether the final results are numerically correct. Consideration is given to other relevant elements that contribute to the *Learning Outcomes* of the course as well as the *Graduate Attributes* of the overall degree program.

The student is cautioned against merely using the assessment criteria as a checklist. When assessing an assignment, elements in the framework will be examined in terms of quality and creativity. Hence ensuring all the listed elements are merely covered in an assignment is often not sufficient in itself and will not automatically lead to full marks being awarded. Other factors such as how the student went about presenting information, how an argument was structured and/or the elements supporting a particular recommendation or outcome are also important.

7. STUDYING A PG COURSE IN MINING ENGINEERING AT UNSW

7.1 How We Contact You

At times, the School or your lecturers may need to contact you about your course or your enrolment. Your lecturers will use the email function through 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 these instructions on how to redirect your UNSW emails: <https://www.it.unsw.edu.au/students/email/index.html>

7.2 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: postgrad.mining@unsw.edu.au

Course inquiries: these should be directed to the course convenor.

7.3 Computing Resources and Internet Access Requirements

UNSW Mining Engineering provides blended learning using the on-line Moodle LMS (Learning Management System).

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.

You can access the School's computer laboratory in-line with the [School laboratory access guidelines](#) and [Class bookings](#).

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)
- Chrome browser or FireFox
- ability to view streaming video (high or low definition UNSW The Box options)

More information about system requirements is available at www.student.unsw.edu.au/moodle-system-requirements.

For distance courses it is also considered essential that you

- Upload a profile picture in Moodle LMS that can be used to verify your identity with your student ID photograph.
- Use a webcam and microphone to actively participate in webinar discussion. Voice participation is essential in webinars, so if you are restricted to text participation only it will not be possible to score full participation grading.

If you have concerns about your web access for a course presented in distance mode, we would encourage you to contact the course convenor before the course commences, to discuss whether it will be possible for you to complete a distance course.

7.4 Accessing Course Materials through Moodle

Course outlines and support materials are uploaded on a Learning Management System (LMS) - Moodle. All enrolled students are automatically included on the Moodle for each course. To access these documents, please visit: www.moodle.telt.unsw.edu.au

7.5 Assessment Criteria for Postgraduate Programs

The assessment criteria provide a framework for you to assess your own work before formally submitting major assignments to your facilitator. Your facilitator will be using this framework to assess your work and as a way to assess whether you have met the listed learning outcomes and the graduate attributes for your program. All students are encouraged to take a closer look at this framework before, during and after completing an assignment.

The descriptions in the framework will help you and your facilitator to identify where your assignment is ranked – from excellent to poor achievement. We ask that you don't use the guidelines as a checklist, but as a tool to assess the quality of your work. Your facilitator will also be looking at the quality, creativity and the presentation of your written assignment as they review the framework.

7.6 Assignment Submissions

The School has developed a guideline to help you when submitting a course assignment. Please take a closer look at all these details on our website: www.engineering.unsw.edu.au/mining-engineering/assignment-submission-policy

We encourage you to retain a copy of every assignment submitted for assessment for your own record either in hardcopy or electronic form. On a rare occasion, assignments may be mislaid and we may contact you to re-submit your assignment.

7.7 Late Submission of an Assignment

Full marks for an assignment are only possible when an assignment is received by the due date. In fairness to those students who do meet the assignment due date and time, deductions will apply to submissions made after this time. Details on deductions that are automatically applied to late submissions are available on our webpage: <http://www.engineering.unsw.edu.au/mining-engineering/late-submissions>

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 as soon as possible: <https://student.unsw.edu.au/special-consideration>

7.8 Course Results

For details on UNSW assessment policy, please visit: <https://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:

- WD – which usually indicates you have not completed one or more items of assessment or 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.

7.9 Special Consideration

You can apply for special consideration through [UNSW Student Central](#) 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: <https://www.student.unsw.edu.au/special-consideration>

7.10 Students Needing Additional Support

The Student Equity and Disabilities Unit (SEADU) aims to provide all students with support and professional advice when circumstances may prevent students from achieving a successful university education. Take a look at their webpage: <http://www.studentequity.unsw.edu.au/>

7.11 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 <https://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: <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.

7.12 Report Writing Guide for Mining Engineers

The School has a report writing guide (RWG) available for all mining engineering students. View this website to download a copy of this guide: https://www.engineering.unsw.edu.au/mining-engineering/sites/mine/files/publications/MEA_ReportWritingGuide_eBook_2018ed.pdf

7.13 Continual Course Improvement

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.

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.



School of Minerals and Energy Resources Engineering

Assessment Cover Sheet

Course Convenor: _____
Course Code: _____ Course Title: _____
Assignment: _____
Due Date: _____
Student Name: _____ Student ID: _____

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.