Faculty of Engineering

School of Minerals and Energy Resources Engineering

Postgraduate Course Outline

MINE8130

Technology Management in Mining

Professor Serkan Saydam

CONTENTS

1. INFORMATION ABOUT THE COURSE 3
2. AIMS, LEARNING OUTCOMES AND GRADUATE ATTRIBUTES 3
3. REFERENCE RESOURCES 4
4. COURSE CONTENT AND LEARNING ACTIVITIES 6
5. COURSE ASSESSMENT 7
6. ASSESSMENT CRITERIA 7
7. STUDYING A UG COURSE IN UNSW MINERALS AND ENERGY RESOURCES ENGINEERING 7

Document Management:
Filename: CourseOutline_UG_MINE8130_T2 2021_17052021
Date last update: 1 July 2021
Changes made by: Serkan Saydam
Revision number: 1

1. INFORMATION ABOUT THE COURSE

Course Code:	MINE8130	Term:	T2, 2021	Level:	PG	Units/Credits	6 UOC
Course Name:	**Technology Management in Mining**						

Course Convenor:	***Professor Serkan Saydam***		
Contact Details	School of Minerals and Energy Resources Engineering Old Main Building, Rm 159H	EMAIL:	s.saydam@unsw.edu.au
		Phone:	+61 2 9385 4525
Contact times	OMB Room 158 and / or Teams		

1.1. Course Description

The course provides:

- an overview of different mining operations and core technologies involved,
- historical and recent trends in mining technology developments, and
- the dynamic management needs of changing technologies, especially in different resource and economic environments.

Some specific technology management issues addressed include:

- Mine economics and the economic drivers, including relativity between capital and operating costs (esp. labour costs),
- Capital justification and performance auditing,
- Background material relating to OHS issues, risk assessments, ergonomic considerations etc., and
- Intellectual Property (IP) issues.

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:

- basic mining and geological terms and descriptions;
- as this is a technical course in a postgraduate program, a fundamental understanding of mathematics and economics are required.

2. AIMS, LEARNING OUTCOMES AND GRADUATE ATTRIBUTES

2.1. Course Aims

This course addresses the changing role of technology within different sectors of the mining industry:

- the impact of that technology on industry performance (economic, safety, social, skills needs etc.), and
- the management needs associated with that technology.

2.2. Learning Outcomes

On completion of this course the student should be able to demonstrate:

1. an understanding of the key drivers within a range of mainstream mining systems, and the role that technology plays in that system performance
2. an ability to analyse the technology needs of a mining situation or system, within the overall mine performance measures – be they economic, safety, social, etc.
3. an understanding of the management requirements associated with the evaluation, implementation and ongoing operation of changing technologies in a mining context.

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

- Hartman, HL, 2002. Introductory Mining Engineering, 2nd edition. Wiley, New York.
- Hustrulid, W and Kuchta, M, 2006. Open Pit Mine Planning & Design, Balkema, Rotterdam.
- Kennedy, BA (ed.), 1990. Surface Mining, 2nd edition, SME, Littleton, Colorado, USA. ISBN 0–87335–102–9.
- Noakes, M and Lanz, T. 1993. Cost Estimation Handbook for the Australian Mining Industry, Monograph No: 20/ Australasian Institute of Mining and Metallurgy.
- Hustrulid, WA, and Bullock, R. (eds.), 2001. Underground Mining Methods: Engineering Fundamentals and International Case Studies, SME, Littleton, USA.
- Gertsch, RE and Bullock, RL (eds.), 1998. Techniques in Underground Mining, SME, Littleton, USA.
- Malone, E. 2011 The Cadia Valley Mines – A Mining Success Story. The AusIMM Spectrum Series 19.
- Kennedy, BA., Editor, 1990. Surface Mining, 2nd edition, Society for Mining, Metallurgy, and Exploration, Littleton, Colorado. ISBN 0–87335–102–9
- Saydam S. (ed) 2008. The Proceedings of The First International Future Mining Conference 2008. The AusIMM 2008
- Saydam S. (ed) 2011. The Proceedings of The Second International Future Mining Conference 2011. The AusIMM 2011

- Rankin, WJ. (ed) 2013. The Sir Maurice Mawby Memorial Volume Third Edition, Vol1 & 2. The AusIMM.

3.2. Other Resources

- *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)

3.3. Online Resources

- Selected readings as well as other supporting material (e.g. course outline and lecture material etc) will be made available on LTMS.
- UNSW Mining and Petroleum subject guide (including a link to ACARP and how to find the reports in the catalogue) http://subjectguides.library.unsw.edu.au/content.php?pid=7632&sid=52212
- UNSW Library services for Postgraduate students http://library.unsw.edu.au/servicesfor/PGandH.html
- New postgraduate course students are strongly advised to visit the above website, and complete the ELISE and ELISE Plus tutorials. These will help develop skills in finding, using and evaluating scholarly information.

Videos are often provided to students as a web stream within the Moodle learning management system. Videos are not available for download by students, unless approved by the Course Convenor and either the Undergraduate or Postgraduate Coursework Director. Special consideration can be provided for students to access videos off-line (eg. working remotely). Please contact the Course Convenor for more information. Note that UNSW reserves the right to deliver videos as a web stream rather than off-line, and cannot provide videos that are copyright from other providers.

3.4. Software and Hardware

- MS Excel

4. COURSE CONTENT AND LEARNING ACTIVITIES

4.1. Course content

The course will be delivered in a series of lectures/tutorials covering the content modules described above in a 5 day, short course delivery mode. This course uses a number of different teaching and learning approaches including:

- Generally short lectures,
- Student presentations,
- Group discussions,
- Syndicated work groups,
- Audio/video podcasts,
- Self-directed activities.

TECHNOLOGY MANAGEMENT IN MINING

24th May – 28th May 2021

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8.30 – 9.30 **Course Introduction and Outline** *Serkan Saydam, UNSW* 9.30 – 10.30 **Introduction to Mining Systems** *Serkan Saydam, UNSW* 10.30 – 11.00 **Morning Tea** 11.00 – 12.30 **Mining Processes** *Serkan Saydam, UNSW* 12.30 – 13.30 **Lunch** 13.30 – 15.30 **Innovation and Technology Change** *Serkan Saydam, UNSW* 15.30 – 16.00 **Afternoon Tea** 16.00 – 17.00 **Mine IoT** *Binghao Li, UNSW*	8.30 – 10.30 **Mine Economics and Technology Management** *Serkan Saydam, UNSW* 10.30 – 11.00 **Morning Tea** 11.00 – 12.00 **Capital Justification / Cost Benefit Analysis** *Jeff Coulton, UNSW* 12.00 – 13.00 **Lunch** 13.00 – 14.00 **Syndicated Work Groups** 14.00 – 16.00 **Risk Management & Technology Audits / Performance Monitoring** *Ismet Canbulat, UNSW* 16.00 – ... **Syndicated Work Groups**	8.30 – 10.00 **Lost Opportunities in Technology Management** *Peter Johnson, Maptek* 10.30 – 12.00 **Technology Evaluation: Case Study (Group Work)** 12.00 – 13.00 **Lunch** 14.00 – 15.00 **Technology Evaluation: Case Study (group presentations)** *Ismet Canbulat & Serkan Saydam, UNSW* 15.00 – ... **Syndicated Work Groups**	8.30 – 9.30 **Syndicated Work Groups** 9.30 – 10.30 **Technology Gaps in Mining** *Serkan Saydam, UNSW* 10.30 – 11.00 **Morning Tea** 11.00 – 12.00 **Technology Development & Commercialisation – The Needs and Expected Outcomes** *Ian Dover, METS Ignited* 12.00 –13.30 **Lunch** 13.30 – 15.30 **Intellectual Property (IP) Management & Protection** *Derek Baigent, Griffith Hack* 15.30 – 16.00 **Afternoon Tea** 16.00 – ... **Syndicated Work Groups**	9.00 – 10.00 **Zero Copper Mine of The Future** *Clare Sykes, LarkinSykes* 10.00 – 12.00 **Syndicated Work Groups** 12.00 – 13.00 **Lunch** 13.00 – 15.00 **Work Group Presentations & Discussions** *Serkan Saydam, UNSW* 15.00 **Course Summary, assignment review and Close** *Serkan Saydam, UNSW*

Total student effort hours: Approx. 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.

Other UNSW Key dates: https://student.unsw.edu.au/new-calendar-dates

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. Specific details of the requirements of the project milestones related to each item of assessment are contained in the *Learning Guide: Mining Research Project*.

Assessment number	Due	Weight	Assessment	Learning outcomes assessed	Comments
A1	Wednesday 27 May	20%	In-Session Assessment Case Study 2	1, 2, 3, 4	Group Work Presentation
A2	Friday 28 May	30%	In-Session Assessment Project	1, 2, 3, 4	Group Work Presentation
A3	**Monday 25 June 5 PM AEST**	**50%**	**Major Assignment**	**1, 2, 3**	**Individual Project**

For further details see the section on *University Policies* for details on assignment submissions, late submissions and special consideration.

6. ASSESSMENT CRITERIA

The assessment criteria provide a framework for you to assess your own work before formally submitting major assignments to your course convenor. Your course convenor 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. We ask that you don't use the assessment criteria guidelines as a checklist, but as a tool to assess the quality of your work. Your course convenor will also be looking at the quality, creativity and the presentation of your written assignment as they review the framework. Rubrics, wherever applicable, will be provided at the time of the assignment release.

7. STUDYING A UG COURSE IN UNSW MINERALS AND ENERGY RESOURCES ENGINEERING

7.1. 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 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:
https://unswinsight.microsoftcrmportals.com/web-forms/

Course inquiries: these should be directed to the Course Convenor.

7.3. Computing Resources and Internet Access Requirements

UNSW Minerals and Energy Resources 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.

Mining Engineering Students: OMB G48/49
Petroleum Engineering Students: TETB

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

7.4. 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

7.5. Assignment Submissions

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 a assessment cover sheet attached.

7.6. 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 following section.

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. Penalty for non-compliance: 10 marks.
- does not have appended at the end of the assignment a completed self-assessment by the student of the assignment using the official Assessment Criteria template. Penalty for non-compliance: 10 marks.

7.7. 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: www.student.unsw.edu.au/special-consideration

7.8. 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:

- 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. 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: www.studentequity.unsw.edu.au/

7.10. 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.

7.11. 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.

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.

8. SCHOOL ASSESSMENT COVER SHEET

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.