MINE8130

Technology Management in Mining

Term 2, 2022

Course Overview

Staff Contact Details

Convenors

Name	Email	Availability	Location	Phone
Serkan Saydam	s.saydam@unsw.edu.au	During the class session times	159	040687662 9

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

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.)
- The management needs associated with that technology

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

- An understanding of the key drivers within a range of mainstream mining systems, and the role that technology plays in that system performance.
- 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.
- An understanding of the management requirements associated with the evaluation, implementation and ongoing operation of changing technologies in a mining context.

The course provides:

- An overview of different mining operations and core technologies involved
- Historical and recent trends in mining technology developments
- 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.
- Intellectual Property (IP) issues

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.)
- The management needs associated with that technology

Course Learning Outcomes

After successfully completing this course, you should be able to:

Learning Outcome	EA Stage 1 Competencies
1. An understanding of the key drivers within a range of mainstream mining systems, and the role that technology plays in that system performance.	PE1.2, PE1.4, PE1.5, PE1.6, PE2.1, PE2.3
2. An ability to analyse the technology needs of a mining situation or system, within the overall mine performance measures Ã¢Â€Â" be they economic, safety, social, etc.	PE1.2, PE1.4, PE1.6, PE2.1, PE2.3, PE2.4, PE3.6
3. An understanding of the management requirements associated with the evaluation, implementation and ongoing operation of changing technologies in a mining context.	PE1.2, PE1.4, PE1.6, PE2.3, PE2.4, PE3.1, PE3.5, PE3.6

Teaching Strategies

The course will be delivered on-line as a series of lectures/tutorials and various activities covering the content modules described above. This course uses a number of different teaching and learning approaches including:

- Industry and UNSW Mining links
- Lecture notes
- Audio/video podcasts
- Student on-line presentations
- Group discussion forums
- Syndicated work groups
- Self-directed activities.

Assessment

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. In-session Assessment- Case Study1 GROUP WORK	10%	01/06/2022 08:00 AM	1, 2, 3
2. In-session Assessment- Case Study2 GROUP WORK	15%	02/06/2022 08:00 AM	1, 2, 3
3. In-session Assessment - Syndicated Group Work	25%	03/06/2022 12:00 PM	1, 2, 3
4. Major Assignment	50%	11/07/2022 05:00 PM	1, 2, 3

Assessment 1: In-session Assessment- Case Study1 GROUP WORK

Start date: 30/05/2022 08:00 AM
Due date: 01/06/2022 08:00 AM

Students will work on groups to implement a preselected technology

Assessment criteria

Assessment criteria can be used for the Case Study Assignment, it comprehends:Outline of Mining Operation/System (10%); Identifying Current and Replaced Technologies (10%); Analysing The Technologies (answer 4 generic Qs) (30%); Capital Justification (30%); Risk Assessment (10%); Conclusions (10%)

Assessment 2: In-session Assessment- Case Study2 GROUP WORK

Start date: 01/06/2022 01:00 PM
Due date: 02/06/2022 08:00 AM

Students will work on groups to implement a preselected technology

Assessment criteria

Assessment criteria can be used for the Case Study Assignment, it comprehends:Outline of Mining Operation/System (5%); Identifying Current and Replaced Technologies (5%); Analysing The Technologies (answer 4 generic Qs) (10%); Capital Justification (30%); Risk Assessment (10%); Management Needs (30%); Conclusions (10%)

Assessment 3: In-session Assessment - Syndicated Group Work

Start date: 30/05/2022 01:00 PM
Due date: 03/06/2022 12:00 PM

Stuxents will work on their selection of technology and implement this tech to a mining operation

Assessment criteria

Assessment criteria can be used for the Case Study Assignment, it comprehends:Outline of Mining Operation/System (5%); Identifying Current and Replaced Technologies (5%); Analysing The Technologies (answer 4 generic Qs) (10%); Capital Justification (30%); Risk Assessment (10%); Management Needs (30%); Conclusions (10%)

Assessment 4: Major Assignment

Start date: 30/05/2022 08:00 AM
Due date: 11/07/2022 05:00 PM

The Major Assignment technical report should be presented as per the MEA Report Writing Guide which can be downloaded from the school web page:http://www.mining.unsw.edu.au/sites/default/files/reportwritingguide.pdfThe assignment submission facility will be linked to Turnitin, a similarity checking system. When submitting an assignment via Turnitin, students are advised the file should contain the final edited and proof copy.

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

Assessment criteria

Summary (5%); identifying techs (10%); analysing techs (30%); FTM (30%); Labour (10%); Management (10%); Conclusions (5%); Report (10%). Failing top deliver pone these tasks may effect the overall mark significantly.

Attendance Requirements

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

Course Schedule

[View class timetable](#)

Timetable

Date/Module	Type	Content
DAY 1	Lecture	9.00 – 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*
	Group Work	16.00 – ... **Syndicated work group projects**
DAY 2	Lecture	9.00 – 10.30 **Mine IoT** *Binghao Li, UNSW* 10.30 – 11.00 **Morning Tea**

		11.00 – 12.30 **Mine Economics and Technology Management** *Serkan Saydam, UNSW* 12.30 – 13.30 **Lunch** 13.30 – 14.30 **Capital Justification / Cost Benefit Analysis** *Jeff Coulton, UNSW* 14.30 – 15.30 15.30 – 16.00 **Afternoon Tea** 15.30 – 17.00 **Lost Opportunities in Technology Management** *Peter Johnson, Maptek*
	Group Work	**14:30 - 15:30 Technology Evaluation: Case Study 1 (Group Work)** **17:00 - ... Technology Evaluation: Case Study 1 (Group Work)**
DAY 3	Presentation	9.00 – 10.30 **Technology Evaluation: Case Study 1 Presentations**
	Group Work	10.30 – 12.00 **Syndicated Work Groups**
	Lecture	**13:00 - 15:00 Risk Management & Technology Audits / Performance Monitoring** *Bruce Hebblewhite, UNSW*
	Group Work	Group Work **15:00 - ... Technology Evaluation: Case Study 2 (Group Work)**

DAY 4	Presentation	9.00 – 10.30 **Technology Evaluation: Case Study 2 Presentations**
	Lecture	11.00 – 12.00 **Technology Development & Commercialisation – The Needs and Expected Outcomes** *Adrian Beer, 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 – 17.00 **Zero Copper Mine of The Future** *Clare Sykes, LarkinSykes*
	Group Work	17.00 - ... **Syndicated Work Groups**
DAY 5	Lecture	9:00 - 10:30 AM Mines of The Future
	Group Work	**10:30 - 13:00** **Syndicated Work Groups**
	Presentation	13:00 - ...

		Work Group Presentations & Discussions

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.

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. 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

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