

# MINE3230

Mine Planning

Term 2, 2023



## Course Overview

### Staff Contact Details

#### Convenors

Name	Email	Availability	Location	Phone
Professor Serkan Saydam	<a href="mailto:s.saydam@unsw.edu.au">s.saydam@unsw.edu.au</a>		Room 159	+61 2 9385 4525

#### Lecturers

Name	Email	Availability	Location	Phone
Adj. Associate Professor Carlos Tapia	<a href="mailto:carlos.tapia@unsw.edu.au">carlos.tapia@unsw.edu.au</a>			+61 2 9385 5006

### School Contact Information

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

For current students, all enquiries and assistance relating to enrolment, class registration, progression checks and other administrative matters, please see [The Nucleus: Student Hub](#).

#### Web & Important Links:

[School of Minerals and Energy Resources](#)

[The Nucleus Student Hub](#)

[Moodle](#)

[UNSW Handbook](#)

[UNSW Timetable](#)

[Student Wellbeing](#)

[Urgent Mental Health & Support](#)

[Equitable Learning Services](#)

# Course Details

## Units of Credit 6

### Summary of the Course

This course integrates fundamental technical knowledge of mining engineering with optimisation, and economic and financial evaluation techniques. It aims to provide students with the essential knowledge and practice needed to evaluate mining assets and generate accurate mine plans.

It will cover all aspects of engineering and operational mine planning and the value chain covering the following study topics:

- Mining Methods
- Mineral Resources and Ore Reserves
- Optimisation Techniques
- Mine Design and Scheduling
- Technical Services
- Mining Technology
- Mineral Economics
- Economic Evaluation
- Financial Math
- Risk assessment
- Mine Closure

The multi-disciplinary nature of the course merges technical aspects of mining engineering, mathematical techniques, and the economic, financial and market aspects of the mining business. It provides a comprehensive understanding of the techniques, variables, and risks of evaluating mine plans and mining projects, determining their bankable feasibility, from construction to production.

### Course Aims

This course aims to introduce the principles and practical methodologies of mine planning and mine valuation. The mine planning project provides students with the opportunity to get involved in the planning process for a real mining project. The knowledge and skills you acquire in this course will be useful not only in your mine design and feasibility courses in 4th year but also when you work as a mining engineer in industry

### Course Learning Outcomes

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

Learning Outcome	EA Stage 1 Competencies
1. Developing knowledge on mine planning processes and the impact of the economic environment on mining operations	PE1.5, PE1.6, PE2.1, PE2.4, PE3.1, PE3.2
2. Awareness of the integration of mine planning and all other components of the mine-to-mill value chain	PE1.1, PE1.3, PE1.5, PE2.1, PE2.2, PE3.3, PE3.6
3. Working knowledge of the technical aspects of mining, financial	PE1.3, PE1.5, PE2.2, PE2.4,

Learning Outcome	EA Stage 1 Competencies
and optimisation techniques and tools	PE3.1, PE3.6
4. Evaluate the role of economics and finance in the mining business and effectively use it to develop financial and technical models to assess mine plans and determine the feasibility of mining projects	PE1.2, PE1.6, PE2.1, PE2.4, PE3.1, PE3.5

## Learning Outcomes

By the end of this course, it is intended that the student will be able to understand:

1. The technical aspects of mining, financial math and optimisation tools for the effective development of accurate mine plans
2. The value chain of the mining business and strategies to maximise its value
3. All aspects of the optimisation processes into mine planning from technical and financial points of view
4. The role of finance in the mining business and effectively use it to develop technical-financial models to assess the value and risk of mine plans and determine the bankable feasibility of mining projects
5. The multi-disciplinary nature of the mining engineering and how to consider, integrate and model all those aspects within an optimal - precise and accurate - mine plan

## Teaching Strategies

This course uses a number of different teaching and learning approaches including:

- Problem/Project-based Learning
- Lectures and Demonstrations
- Industry Guest Lectures
- Question/Answer Sessions
- Software Demonstrations / Trainings
- Self-directed Activities
- Group Activities
- Examinations

1. Project-based Learning: This course utilises project-based learning methods. Students will be given two group projects to work on. Students are required to work in groups, share the project workload, and have weekly meetings and discussions.
2. Lectures and Demonstrations: Project work will be supported with weekly consultative and information-sharing session. The content of these are aligned with the projects to help students. Although this is an activity-based course, it is a requirement that all work is conducted within the School.
3. Group Work: Members of a group may elect to work on a topic of the project they feel more comfortable with, but should integrate their work into the whole project. This should be reported back at their team meetings. Some marks will be taken from the underperforming students and allocated to the other group members. If a student makes no contribution to the project, he/she will receive zero for that project.
4. Effective Communication: One of the most effective means of learning is to effectively communicate what has been learned. Part of the assessment in this course will be determined by

how effectively the results are communicated. There are a number of opportunities for this in the form of presentations and final reports. The process of writing reports, brainstorming within a design team, preparation and presentation of report both in front of an audience and in report form, requires clarity of thinking, defending and revising a design and analysing the risks inherent in a project.

5. Quiz: Two quizzes will be conducted in a controlled environment. The details are given under Assessment Section.
6. Final Exam: A Final Exam will be conducted during the exam term. The details are given under Assessment Section.

# Assessment

## Detailed Information on Assessment Tasks

**Quiz 1 (Q1) and Quiz 2 (Q2) – (10% each):** Tests constitute multiple choice, true-false, short-answer, and relatively short computations-based questions. The questions are derived from the theoretical background and computations discussed during lectures and demonstrations. Students must present computational steps, if necessary. Marks are deducted for missing steps or incomplete solutions. Parameters, variables, units, and applicable assumptions must be clearly defined in computations. The right answers, procedures and solutions of questions involving calculations will be published immediately after marking release.



**Mine Planning Project (40%: 24% Group Work + 16% Individual Assessment):** The Mine Planning project encompasses two parts.

**Assignment 1 (A1) – Manual Procedure (20%):** This part is based on a small-scale (hypothetical) ore body model and relevant economic/technical parameters. Students should develop an economic valuation model and its respective economic evaluation (manually or using MS Excel), including 1) mining method selection, 2) cut-off grade, processing and logistics strategists, 3) either ultimate pit limit or footprint, 4) production schedule, 5) Capex and Opex, 6) evaluation and recommendations. Students are required to work in groups/teams. The assessment considers 15 min interview weighing 40% of the Assignment mark (8%). A formal report and a softcopy of calculations are expected for grading. The detailed marks distribution for each task will be provided as part of the project statement, weighing 60% of the Assignment mark (12%).

**Assignment 2 (A2) – Mining Software Assistance (20%):** This part is based on a full-scale actual ore body block model and relevant economic/technical parameters. Assisted by mining software, students should generate an appropriate technical/economic model to determine: 1) the ultimate pit, 2) the eventual transition level between Open Pit and Underground operations, 3) the economic footprint (if it proceeds), and 4) the production and development schedule. Students should also include a detailed economic evaluation, including 1) economic valuation, 2) financial & technical model, 3) risk assessment, and 4) recommendations. The assessment considers 15 min interview weighing 50% of the Assignment mark (10%). A formal report is expected for grading, and the detailed marks distribution for each task will be provided as part of the project statement, weighing 50% of the Assignment mark (10%).

**Group Composition:** Given the expected number of students and project requirements, the students are required to form a group of 3 to 4 members. Students are encouraged to form multicultural teams. Group formation must be completed with the submission of members' names and IDs by June 19 2023.

**Final Examination (40%):** The final Examination is comprehensive in nature, as it covers all topics (lectures and demonstrations). It constitutes major computations-based questions. However, it may include multiple-choice, true-false, short-answer, and/or relatively short computations-based questions. Details on the final exam structure will be provided as part of the unit review in Week 10. Students must present all computational steps, if necessary. Marks will be deducted for missing steps or incomplete solutions. Parameters, variables, units, and applicable assumptions must be clearly defined in computations. If required, formulae will be provided in the final Examination.

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Quiz	20%	16/06/2023 06:00PM & 17/07/2023 06:00PM	1, 2, 3
2. Strategic Mine Planning Project Part A Manual Procedure 	20%	17/07/2023 11:59 PM	1, 2, 3
3. Strategic Mine Planning Project Part B Mining Software Assistance 	20%	31/07/2023 11:59 PM	1, 2, 3
4. Final Examination	40%	Not Applicable	1, 2, 3, 4

### Assessment 1: Quiz

**Start date:** 16/06/2023 05:00 PM

**Due date:** 16/06/2023 06:00PM & 17/07/2023 06:00PM

This activity encompasses two (2) Quiz consisting of up to 20 questions. Each Quiz should be completed within one (Q1) and two hours (Q2). Questions will test a combination of theoretical knowledge and the application of this via questions that require you to perform calculations. Quiz 1 and 2 will test the topics discussed and addressed in the first few weeks of the course in the lead up to the quiz.

#### Additional details

The weight of each question will be determined based on the type and complexity of the question and will be noted on each one of the questions of the quiz. Each multiple selection or true or false question will be marked as correct (full mark) or incorrect (no mark). In the case of calculation questions, partial marks will be established based on the procedure and partial results obtained. Open questions might also be partially marked if they address the key points asked.

### Assessment 2: Strategic Mine Planning Project Part A Manual Procedure (Group)

**Start date:** 26/06/2023 06:00 PM

**Submission notes:** Assignments to be submitted through Moodle

**Due date:** 17/07/2023 11:59 PM

This task requires you to work in groups of three to develop your ability to create value from an ore deposit by using the key levers for value creation as part of the strategic mine planning process.

#### Assessment criteria

A detailed task sheet, criteria and electronic files of a hypothetical deposit block model will be handed out to groups in week 3 to work on the project as each weekly topic is discussed and presented.

### Assessment 3: Strategic Mine Planning Project Part B Mining Software Assistance

## **(Group)**

**Start date:** 10/07/2023 06:00 PM

**Submission notes:** Assignments to be submitted through Moodle

**Due date:** 31/07/2023 11:59 PM

This project will consist of an activity requiring the use of the Whittle 4X Software Package.

### **Assessment criteria**

The task requires the development of an appropriate mining optimisation of an Open-pit or Underground project or a mix of both. The task should be developed using any mining software available at UNSW.

Reliable sources and auditable records of calculations must back up all assumptions and calculations. The whole project (database) used for the optimisation process through the mining software must be provided

### **Assessment 4: Final Examination**

**Marks returned:** A minimum achievement of 40% in the Final Exam is required to receive a passing grade for the Course.

The Final Exam is a comprehensive two-hour exam on all topics addressed in this Course throughout the period. Questions assess theoretical knowledge and practical application of mining engineering techniques to solve practical problem-based questions requiring drawing meaningful conclusions from calculations and engineering criteria.

In this Examination, only UNSW-approved (labelled) calculators are allowed.

The exam contains up to ten (10) questions, and the marking criteria are the same as in point 5.2. Students must answer eighty per cent (80%) of the questions



## Attendance Requirements

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

## Course Schedule

[View class timetable](#)

### Timetable

Date	Type	Content
O-Week: 22 May - 26 May		
Week 1: 29 May - 2 June		<p><b>Block A: Technical Concepts (Geology)</b></p> <ul style="list-style-type: none"> <li>Block Model, Geological Model, Resources Estimation, Mineral Resources and Ore Reserves</li> </ul> <p><b>Block B: Technical Concepts (Engineering)</b></p> <ul style="list-style-type: none"> <li>Mining Method Selection</li> <li>Mine Planning</li> <li>Dragline and Soft-Rock Mining</li> </ul>
Week 2: 5 June - 9 June		<p><b>Block A: Technical □ Economic Strategies</b></p> <ul style="list-style-type: none"> <li>Cut-off Grade and Eq. Ore Grade</li> </ul> <p><b>Block B: Technical □ Economic Strategies</b></p> <ul style="list-style-type: none"> <li>Mining Infrastructure, Mineral Processing and Value Chain</li> </ul>
Week 3: 12 June - 16 June		<p><b>Block A: Optimisation I</b></p> <ul style="list-style-type: none"> <li>Linear Programming (LP)</li> </ul> <p><b>Block B: Demonstration &amp; Quiz</b></p> <ul style="list-style-type: none"> <li>LP</li> <li>Quiz 1: Tech Concepts, Strategy and Optimisation</li> </ul>
Week 4: 19 June - 23 June		<p><b>Block A and B: Planning &amp; Optimisation (Surface Mining)</b></p>

		<ul style="list-style-type: none"> <li>• Floating Cone, Lerchs &amp; Grossman</li> <li>• Mine Design &amp; Scheduling</li> </ul>
Week 5: 26 June - 30 June		<p><b>Block A and B: <i>Planning &amp; Optimisation (Underground Mining)</i></b></p> <ul style="list-style-type: none"> <li>• Economic Footprint and Stopes</li> <li>• Mine Design &amp; Scheduling</li> </ul>
Week 6: 3 July - 7 July		<p><b>Free Week □ Consultations (activities are optional)</b></p>
Week 7: 10 July - 14 July		<p><b>Block A: <i>Technology</i></b></p> <ul style="list-style-type: none"> <li>• Mining Technology and Mine Planning</li> </ul> <p><b>Block B: <i>Training</i></b></p> <ul style="list-style-type: none"> <li>• Software Whittle Training</li> </ul>
Week 8: 17 July - 21 July		<p><b>Block A: <i>Optimisation II</i></b></p> <ul style="list-style-type: none"> <li>• Fleet Optimisation</li> </ul> <p><b>Block B: <i>Quiz</i></b></p> <ul style="list-style-type: none"> <li>• Quiz 2 Mine Planning &amp; Scheduling</li> </ul>
	Assessment	Strategic Mine Planning Project Part A Manual Procedure: Assignments to be submitted through Moodle
Week 9: 24 July - 28 July		<p><b>Block A: <i>Technical Services</i></b></p> <ul style="list-style-type: none"> <li>• Geomechanics</li> <li>• Ventilation, Survey and Geology</li> </ul> <p><b>Block B: <i>Interview</i></b></p> <ul style="list-style-type: none"> <li>• A2 Interview</li> </ul>
Week 10: 31 July - 4 August		<p><b>Block A: <i>Financial &amp; Technical Model</i></b></p> <ul style="list-style-type: none"> <li>• Mineral Economics</li> <li>• Financial Modelling &amp; Project Valuation Strategies</li> </ul> <p><b>Block B: <i>Course Review</i></b></p> <ul style="list-style-type: none"> <li>• Q&amp;A</li> </ul>
	Assessment	Strategic Mine Planning Project Part B Mining Software Assistance : Assignments to be

submitted through Moodle

## Resources

### Recommended Resources

### Reference Material

- Camus, J P, 2002. *Management of Mineral Resources Creating Value in the Mining Business*, (Society for Mining, Metallurgy, and Exploration, Inc.: Littleton, CO, USA).
- Card, P, (2011) *Guidelines for economic evaluation of projects*, METPLANT 2011 - Metallurgical Plant Design and Operating Strategies, , pp. 1-11.
- Darling, P, 2011. *SME Mining Engineering Handbook*, 3Edition, (Society for Mining, Metallurgy, and Exploration, Inc.: Littleton, CO, USA).
- Dewhirst, R F and Knight Merz, S, 2013. Monograph 27 - Cost Estimation Handbook, 2Edition (The Australian Institute of Mining and Metallurgy: Australia).
- Gordon, R.L., Tilton, J.E., 2008. *Mineral economics: Overview of a discipline*. Resour. Policy 33, 4–11.
- Hall, B, 2014. *Cut-off Grades and Optimising the Strategic Mine Plan*, 300 p (The Australian Institute of Mining and Metallurgy: Australia).
- Hustrulid, W A, and Kuchta, M, 2006. *Open Pit Mine Planning & Design*, Volume 1 – Fundamentals, Edition (Taylor and Francis: London).
- InfoMine, 2015. Industry Standard for Mining Cost Estimating [online], Available from:
- Lane, K F, 1988. *The Economic Definition of Ore - Cut-Off Grades in Theory and Practice*, (Mining Journal Books Limited, London).
- Pindyck, R.S., Rubinfeld, D.L., 2009. *Microeconomics*. Pearson/Prentice Hall.
- Rendu, J M, 2014. *Introduction to Cut-off Grade Estimation*, Edition, (Society for Mining, Metallurgy, and Exploration, Inc.: Littleton, CO, USA).
- Rudenno, V, 2004. *The Mining Valuation Handbook – Australian Mining and Energy Valuation for Investors and management*, 430 p (Wright Books: Victoria).
- Runge, I C, 1998. *Mining Economics and Strategy*, (Society for Mining, Metallurgy, and Exploration, Inc.: Littleton, CO, USA).
- US Federal Reserve. *FRB: H.10 Release--Foreign Exchange Rates--Nominal/Real Indexes* [online] Available from: < [https://www.federalreserve.gov/releases/h10/summary/indexb\\_m.htm](https://www.federalreserve.gov/releases/h10/summary/indexb_m.htm)>
- World Bank, *Global Economic Monitor (GEM) Commodities* World DataBank [on-line].

### Other Resources

Selected readings as well as other supporting material (e.g. course outline and lecture notes will be made available on LMS. Videos are often provided to students as a webstream 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 (e.g. working remotely). Please contact the Course Convenor for more information. Note that UNSW reserves the right to deliver videos as a webstream rather than off-line and cannot provide videos that are copyright by other providers.

### On-line Resources

There are numerous articles/information sources on reservoir engineering on the web. Many of them are sound, but many are either very lightweight or contain errors. Be very careful in your choice of web sources. Remember, UNSW librarians are usually happy to help you locate articles or make suggestions regarding possible material to help you in your academic work. You can also access basic on-line help at

<http://www.library.unsw.edu.au/>

## **Software and Hardware**

- GEOVIA Whittle 4.5 [or 4.6 recently resealed version
- Maptek Vulcan 2022.1
- Microsoft Excel - Solver

## **Course Evaluation and Development**

### **Course Results**

For details on UNSW assessment policy, please visit: [www.student.unsw.edu.au/assessment](http://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-enrol in the course.

## 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 Assignment

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 may be eligible for special consideration, when an illness or other short-term events beyond your control (exceptional circumstances) affect your assessment performance. More details on special consideration can be found at: [www.student.unsw.edu.au/special-consideration](http://www.student.unsw.edu.au/special-consideration)

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.

## 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](http://www.library.unsw.edu.au)
- Academic Skills Support - <https://www.student.unsw.edu.au/skills>
- Psychology and Wellness - [www.counselling.unsw.edu.au](http://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 academic skills, please contact the Academic Skills Support or view some of the resources on their website: <https://www.student.unsw.edu.au/skills>. The Academic Skills Team can provide resources, support and assistance to help you improve your academic 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](http://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

### Student Resources

This engineering [student resources](#) section collates useful advice and information to ensure you're able to focus on your studies.

### 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](http://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)

*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.microsoftcrmpartals.com/web-forms/>
- Course inquiries should be directed to the Course Convenor

## Image Credit

<https://portal.engineersaustralia.org.au/event/2021/05/infrastructure-thought-leaders-series-design-construction-and-maintenance-mining>

## 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	✓