



ENAR12014 Introduction to Mining Technology and Mineral Processing

Term 1 - 2018

Profile information current as at 07/05/2024 01:35 pm

All details in this unit profile for ENAR12014 have been officially approved by CQUUniversity and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

General Information

Overview

This unit introduces students to the improved safety and productivity of mining methods from an historical perspective. Students will investigate the social, environmental and economic sustainability of Australian mining operations and the impact of Australian laws on coal and metalliferous, underground and surface mining, blast design, and mineral processing. During the unit students will be expected to demonstrate an effective and professional level of teamwork, communication and support for collaborative peer group learning through the use of forums, reflective journals and workbooks.

Details

Career Level: *Undergraduate*

Unit Level: *Level 2*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

There are no requisites for this unit.

Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the [Assessment Policy and Procedure \(Higher Education Coursework\)](#).

Offerings For Term 1 - 2018

- Distance

Attendance Requirements

All on-campus students are expected to attend scheduled classes – in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

Website

[This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.](#)

Class and Assessment Overview

Recommended Student Time Commitment

Each 6-credit Undergraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

Class Timetable

[Regional Campuses](#)

Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

[Metropolitan Campuses](#)

Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

1. **Written Assessment**

Weighting: 20%

2. **Written Assessment**

Weighting: 35%

3. **Written Assessment**

Weighting: 45%

4. **Portfolio**

Weighting: Pass/Fail

Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the [University's Grades and Results Policy](#) for more details of interim results and final grades.

CQUniversity Policies

All University policies are available on the [CQUniversity Policy site](#).

You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the [CQUniversity Policy site](#).

Previous Student Feedback

Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

Feedback from Unit Coordinator

Feedback

Highly recommend students attend online tutorials.

Recommendation

Send students emails or meeting requests to remind them of tutorial times.

Unit Learning Outcomes

On successful completion of this unit, you will be able to:

1. Analyse the historical development of mining methods to determine the key factors that have improved the safety and productivity of mining operations.
2. Assess the social, environmental and economic sustainability of Australian mining operations.
3. Outline the acts and regulations associated with Australian law that impact on blast design and mineral processing for surface, underground, coal and metalliferous mining.
4. Determine a suitable blast design for a coal or metalliferous deposit in a surface mining operation.
5. Evaluate suitable mineral processing methods for the extraction, separation and concentration of various coal and metalliferous products.
6. Demonstrate an effective and professional level of teamwork, communication and support for collaborative peer group learning through the use of forums, reflective journals and workbooks.

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes					
	1	2	3	4	5	6
1 - Written Assessment - 20%	•	•	•			
2 - Written Assessment - 35%		•	•	•		
3 - Written Assessment - 45%			•	•	•	
4 - Portfolio - 0%	•	•	•	•	•	•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6
1 - Communication			•	•		•
2 - Problem Solving		•		•	•	
3 - Critical Thinking	•	•	•	•	•	
4 - Information Literacy	•	•	•	•	•	•
5 - Team Work						•
6 - Information Technology Competence		•	•	•	•	•
7 - Cross Cultural Competence	•		•			•
8 - Ethical practice	•		•			•
9 - Social Innovation						
10 - Aboriginal and Torres Strait Islander Cultures						

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
1 - Written Assessment - 20%	•	•	•	•			•	•		
2 - Written Assessment - 35%	•	•	•	•		•				
3 - Written Assessment - 45%	•	•	•	•		•				
4 - Portfolio - 0%	•		•	•	•	•	•	•		

Textbooks and Resources

Textbooks

ENAR12014

Prescribed

Introductory Mining Engineering

Edition: 2nd edn (2002)

Authors: Hartman, HL & Mutmanský, JM

John Wiley and Sons

Hoboken, NJ, USA

ISBN: 9780471348511

Binding: Hardcover

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Zoom capacity (web cam and microphone)

Referencing Style

All submissions for this unit must use the referencing style: [Harvard \(author-date\)](#)

For further information, see the Assessment Tasks.

Teaching Contacts

Andrew Hammond Unit Coordinator

a.hammond@cqu.edu.au

Schedule

Week 1 - 05 Mar 2018

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to Mining	Hartman & Mutmanský Chapter 1: Introductory Mining Engineering, Reading in Week 1 Moodle Block	Weekly Zoom Tutorial Session - Course Introduction

Week 2 - 12 Mar 2018

Module/Topic	Chapter	Events and Submissions/Topic
Mine Development	Hartman & Mutmanský Chapter 4: Sections 4.1 to 4 Chapter 6: Sections 6.1 Reading in Week 2 Moodle Block	Weekly Zoom Tutorial Session - Mine Development

Week 3 - 19 Mar 2018

Module/Topic	Chapter	Events and Submissions/Topic
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Mining Methods	Hartman & Mutmanský Chapter 07: Sections 7.1 to 7.5 Chapter 08: All Chapter 09: Sections 9.1 to 9.5 Chapter 10: Sections 10.1 to 10.5 Chapter 11: Sections 11.1 to 11.5 Chapter 12: Sections 12.1 to 12.4 Reading in Week 3 Moodle Block	Weekly Zoom Tutorial Session - Mining Methods
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Week 4 - 26 Mar 2018

Module/Topic	Chapter	Events and Submissions/Topic
Mine Surveying	Reading in Week 4 Moodle Block	Weekly Zoom Tutorial Session - Mine Surveying Assignment 1 and Portfolio 1 Assignment 1 Due: Week 4 Monday (26 Mar 2018) 6:00 pm AEST

Week 5 - 02 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic
Mine Planning	Hartman & Mutmanský Chapter 06: Sections 6.2 to 6.5 Chapter 07: Sections 7.7 Chapter 09: Sections 9.6 Chapter 10: Sections 10.6 and 10.7 Chapter 11: Sections 11.1 to 11.6 Reading in Week 5 Moodle Block	Weekly Zoom Tutorial Session Session - Mine Planning

Vacation Week - Non Teaching Week - 09 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic
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Week 6 - 16 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic
Blast Design	Reading in Week 6 Moodle Block	Weekly Zoom Tutorial Session - Blast Design

Week 7 - 23 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic
Mine Ventilation and Mine Environmental Hazards	Hartman & Mutmanský Chapter 12: Section 12.5 Reading in Week 7 Moodle Block	Weekly Zoom Tutorial Session Session - Mine Ventilation Assignment 2 and Portfolio 2 Assignment 2 Due: Week 7 Friday (27 Apr 2018) 6:00 pm AEST

Week 8 - 30 Apr 2018

Module/Topic	Chapter	Events and Submissions/Topic
Mining and the Environment	Hartman & Mutmanský Chapter 2: Section 2.4 Reading in Week 8 Moodle Block	Weekly Zoom Tutorial Session - Mining and the Environment

Week 9 - 07 May 2018

Module/Topic	Chapter	Events and Submissions/Topic
Health and Safety	Hartman & Mutmanský Chapter 2: Section 2.3 Reading in Week 9 Moodle Block	Weekly Zoom Tutorial Session - Health and Safety

Week 10 - 14 May 2018

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to Mineral Processing	Reading in Week 10 Moodle Block	Weekly Zoom Tutorial Session - Introduction to Mineral Processing

Week 11 - 21 May 2018

Module/Topic	Chapter	Events and Submissions/Topic
Metallurgical Processing	Reading in Week 11 Moodle Block	Weekly Zoom Tutorial Session - Metallurgical Processing

Week 12 - 28 May 2018

Module/Topic	Chapter	Events and Submissions/Topic
Hydrometallurgical Processing	Reading in Week 12 Moodle Block	Weekly Zoom Tutorial Session - Hydrometallurgical Processing

Review/Exam Week - 04 Jun 2018

Module/Topic	Chapter	Events and Submissions/Topic
		Assignment 3 and Portfolio 3
		Assignment 3 Due: Review/Exam Week Monday (4 June 2018) 6:00 pm AEST
		Learning Portfolio Due: Review/Exam Week Wednesday (6 June 2018) 6:00 pm AEST

Exam Week - 11 Jun 2018

Module/Topic	Chapter	Events and Submissions/Topic
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Assessment Tasks

1 Assignment 1

Assessment Type

Written Assessment

Task Description

This assessment is designed to strengthen your understanding of the historical development of mining methods and their social, environmental and economic impacts on Australian society. You will need to carefully review the material provided in Moodle and to answer the questions in the assignment.

In order to achieve this you will need to:

- review the detailed assignment questions found in Moodle
- review relevant literature (textbooks, websites, etc) to gain a broad understanding of costs, processes and procedures associated with sampling and testing rocks.
- research the primary literature to locate relevant current primary sources (i.e. scientific journal articles written in the last 3 years)
- complete the assignment questions in your own words that makes effective use of the sources of information

Your assignment should be produced in an electronic format using word, excel and pdf documents. Submit your assignment through the assessment link on Moodle.

Note: All submissions are processed through the similarity detection software (called Turnitin), hence the requirement to submit the documents as pdf files. You must ensure that all of the work is your own, in line with University requirements.

Assessment Due Date

Week 4 Monday (26 Mar 2018) 6:00 pm AEST

Return Date to Students

Week 6 Monday (16 Apr 2018)

Assignments will be returned within a fortnight once all have been submitted for assessment

Weighting

20%

Minimum mark or grade

50%

Assessment Criteria

Use clear, coherent sentences.

Where appropriate, include clearly labelled diagrams.

Ensure photographs, pictures and diagrams are correctly labelled, introduced and referred to within the text of the answer.

Ensure formulae and workings are shown in sufficient detail to clearly explain how the answer was derived.

Answers should show correct units of measure eg. (m, MN, m², tonnes, m³, °C, etc).

Correctly cite and reference sources of information. Include a list of references at the end of the assignment.

Use mining and mineral processing terminology correctly.

Refer to assignment specific assessment criteria listed in Moodle for further details.

Referencing Style

- [Harvard \(author-date\)](#)

Submission

Online

Submission Instructions

Use Turnitin and Moodle site to submit assignments.

Learning Outcomes Assessed

- Analyse the historical development of mining methods to determine the key factors that have improved the safety and productivity of mining operations.
- Assess the social, environmental and economic sustainability of Australian mining operations.
- Outline the acts and regulations associated with Australian law that impact on blast design and mineral processing for surface, underground, coal and metalliferous mining.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Cross Cultural Competence
- Ethical practice

2 Assignment 2

Assessment Type

Written Assessment

Task Description

This assessment is designed to strengthen your understanding of the technical aspects of mining associated with drilling and fragmentation, mining acts and regulations and ventilation. You will need to carefully review the material provided in moodle and to answer the questions in the assignment.

In order to achieve this you will need to:

- review the detailed assignment questions found in Moodle
- review relevant literature (textbooks, websites, etc) to gain a broad understanding of costs, processes and procedures associated with sampling and testing rocks.
- research the primary literature to locate relevant current primary sources (scientific journal articles written in the last 3 years)
- complete the assignment questions in your own words that makes effective use of the sources of information

Your assignment should be produced in an electronic format using word, excel and pdf documents. Submit your assignment through the assessment link on Moodle.

Note: All submissions are processed through the similarity detection software (called Turnitin), hence the requirement to submit the documents as pdf files. You must ensure that all of the work is your own, in line with University requirements.

Assessment Due Date

Week 7 Friday (27 Apr 2018) 6:00 pm AEST

Return Date to Students

Week 9 Friday (11 May 2018)

Assignments will be returned within a fortnight once all have been submitted for assessment

Weighting

35%

Minimum mark or grade

50%

Assessment Criteria

Use clear, coherent sentences.

Where appropriate, include clearly labelled diagrams.

Ensure photographs, pictures and diagrams are correctly labelled, introduced and referred to within the text of the answer.

Ensure formulae and workings are shown in sufficient detail to clearly explain how the answer was derived.

Answers should show correct units of measure eg. (m, MN, m², tonnes, m³, °C, etc).

Correctly cite and reference sources of information. Include a list of references at the end of the assignment.

Use mining and mineral processing terminology correctly.

Refer to assignment specific assessment criteria listed in Moodle for further details.

Referencing Style

- [Harvard \(author-date\)](#)

Submission

Online

Submission Instructions

Use Turnitin and Moodle site to submit assignments.

Learning Outcomes Assessed

- Assess the social, environmental and economic sustainability of Australian mining operations.
- Outline the acts and regulations associated with Australian law that impact on blast design and mineral processing for surface, underground, coal and metalliferous mining.
- Determine a suitable blast design for a coal or metalliferous deposit in a surface mining operation.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence

3 Assignment 3

Assessment Type

Written Assessment

Task Description

This assessment is designed to strengthen your understanding of the technical aspects of mining and mineral processing. You will need to carefully review the material provided in Moodle and to answer the questions in the assignment.

In order to achieve this you will need to:

- review the detailed assignment questions found in Moodle
- review relevant literature (textbooks, websites, etc) to gain a broad understanding of costs, processes and procedures associated with sampling and testing rocks.
- research the primary literature to locate relevant current primary sources (scientific journal articles written in the last 3 years)
- complete the assignment questions in your own words that makes effective use of the sources of information

Your assignment should be produced in an electronic format using word, excel and pdf documents. Submit your assignment through the assessment link on Moodle.

Note: All submissions are processed through the similarity detection software (called Turnitin), hence the requirement to submit the documents as pdf files. You must ensure that all of the work is your own, in line with University requirements.

Assessment Due Date

Review/Exam Week Monday (4 June 2018) 6:00 pm AEST

Return Date to Students

Exam Week Friday (15 June 2018)

Assignments will be returned within a fortnight once all have been submitted for assessment

Weighting

45%

Minimum mark or grade

50%

Assessment Criteria

Use clear, coherent sentences.

Where appropriate, include clearly labelled diagrams.

Ensure photographs, pictures and diagrams are correctly labelled, introduced and referred to, within the text of the answer.

Ensure formulae and workings are shown in sufficient detail to clearly explain how the answer was derived.

Answers should show correct units of measure eg. (m, MN, m², tonnes, m³, °C, etc).

Correctly cite and reference sources of information. Include a list of references at the end of the assignment.

Use mining and mineral processing terminology correctly.

Refer to assignment specific assessment criteria listed in Moodle for further details.

Referencing Style

- [Harvard \(author-date\)](#)

Submission

Online

Submission Instructions

Use Turnitin and Moodle site to submit assignments.

Learning Outcomes Assessed

- Outline the acts and regulations associated with Australian law that impact on blast design and mineral processing for surface, underground, coal and metalliferous mining.
- Determine a suitable blast design for a coal or metalliferous deposit in a surface mining operation.
- Evaluate suitable mineral processing methods for the extraction, separation and concentration of various coal and metalliferous products.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence

4 Learning Portfolio

Assessment Type

Portfolio

Task Description

The "Learning Portfolio" provides you with an opportunity to reflect on what you are learning. You will record in the Learning Portfolio, notes on any work and reading that is relevant to the learning outcomes detailed in the course profile. You will record and demonstrate evidence of all of the learning outcomes detailed for this course, particularly teamwork, cultural sensitivity and ethical values. The Learning Portfolio provides you with an opportunity to discuss your learning experiences online. It is also a record of websites, texts and journal articles that may be useful for future reference in your career in mining.

With each assignment submitted you will also submit an updated version of your Learning Portfolio. There are three elements to the portfolio,

1. Study Diary
2. Learning Reflections
3. Interactions

Each element should contain updates when submitted with an assignment.

Maintain a "Learning Journal" while you are working on this course. Spend the last 5 minutes of any study session updating your Learning Journal.

Reflect on your learning and record what you have been working on. Record your work and background reading that is completed as part of the preparation for submitting an assignment.

Record your online discussions and interactions and map them to the learning outcomes for this course.

Record and demonstrate evidence of all of the learning outcomes detailed for this course, particularly teamwork, cultural

sensitivity and ethical values.

Assessment Due Date

Review/Exam Week Wednesday (6 June 2018) 6:00 pm AEST

A copy of your updated learning portfolio should be submitted with each assignment submission.

Return Date to Students

Exam Week Friday (15 June 2018)

Your Learning Portfolio will be returned with comments along with your marked assignments.

Weighting

Pass/Fail

Minimum mark or grade

Pass or Fail

Assessment Criteria

With each assignment submitted you will also submit an updated version of your Learning Portfolio. There are three elements to the Learning Portfolio,

1. Study Diary
2. Learning Reflections
3. Interactions

Each element should contain updates when submitted with an assignment.

Maintain a Learning Journal while you are working on this course. Spend the last 5 minutes of any study session updating your Learning Journal.

Reflect on your learning and record what you have been working on. Record your work and background reading that is completed as part of the preparation for submitting an assignment.

Record your online discussions and interactions and map them to the learning outcomes for this course.

Record and demonstrate evidence of all of the learning outcomes detailed for this course, particularly teamwork, cultural sensitivity and ethical values.

Referencing Style

- [Harvard \(author-date\)](#)

Submission

Online

Learning Outcomes Assessed

- Analyse the historical development of mining methods to determine the key factors that have improved the safety and productivity of mining operations.
- Assess the social, environmental and economic sustainability of Australian mining operations.
- Outline the acts and regulations associated with Australian law that impact on blast design and mineral processing for surface, underground, coal and metalliferous mining.
- Determine a suitable blast design for a coal or metalliferous deposit in a surface mining operation.
- Evaluate suitable mineral processing methods for the extraction, separation and concentration of various coal and metalliferous products.
- Demonstrate an effective and professional level of teamwork, communication and support for collaborative peer group learning through the use of forums, reflective journals and workbooks.

Graduate Attributes

- Communication
- Critical Thinking
- Information Literacy
- Team Work
- Information Technology Competence
- Cross Cultural Competence
- Ethical practice

Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the [Student Academic Integrity Policy and Procedure](#). This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

What is a breach of academic integrity?

A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

Why is academic integrity important?

A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

Where can I get assistance?

For academic advice and guidance, the [Academic Learning Centre \(ALC\)](#) can support you in becoming confident in completing assessments with integrity and of high standard.

What can you do to act with integrity?



Be Honest

If your assessment task is done by someone else, it would be dishonest of you to claim it as your own



Seek Help

If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)



Produce Original Work

Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem