



ENAR11001 Resource Geology

Term 1 - 2020

Profile information current as at 26/04/2024 07:26 am

All details in this unit profile for ENAR11001 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 is an introduction to geological resources - metals, minerals, coal, oil and gas, and construction materials. It prepares you to assess, and effectively communicate the geological setting, quality and grade of geological resources. The unit balances this with consideration of infrastructure and methods of accessing and extracting the geological resources in a socially, culturally and environmentally responsible manner. You will work individually and collaboratively to consider resource geology issues. You will investigate resource geology in a defined context and carry out standard sampling strategies and apply techniques for locating resources, grade control and resource estimation.

Details

Career Level: *Undergraduate*

Unit Level: *Level 1*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

Prerequisite: PHYG12003 Geological Science Corequisite: PHYG12003 Geological Science

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 - 2020

- Online

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: 25%

2. **Written Assessment**

Weighting: 25%

3. **Presentation**

Weighting: 20%

4. **Written Assessment**

Weighting: 30%

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 Student Feedback

Feedback

Enjoyed the unit and learnt a lot.

Recommendation

To continue to offer a unit that is both relevant to industry and has currency.

Unit Learning Outcomes

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

1. Discuss the fuel, ore and industrial mineral resources in Australia
2. Identify and describe fuel, ore and industrial minerals and the typical characteristics of such mineral deposits
3. Describe mineral exploration methods and their application
4. Describe processes used to evaluate and quantify mineral reserves
5. Identify impacts of mining exploration in a socially, culturally and environmentally sensitive manner
6. Prepare project reports and demonstrate an effective, professional level of teamwork and communication, and support collaborative peer group learning.

This unit assists students to develop the Engineers Australia Stage 1 competencies for Engineering Associates targeting knowledge and skill base, engineering application ability and professional and personal attributes.

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 - 25%	•	•				
2 - Written Assessment - 25%			•	•		
3 - Presentation - 20%					•	•
4 - Written Assessment - 30%					•	•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6
1 - Communication	•	•	•	•	•	•

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6
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 - 25%	•	•		•						
2 - Written Assessment - 25%	•			•		•	•	•		
3 - Presentation - 20%	•	•		•	•	•	•	•		
4 - Written Assessment - 30%	•		•	•			•	•		

Textbooks and Resources

Textbooks

There are no required textbooks.

Additional Textbook Information

Readings will be supplied on Moodle.

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Zoom

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 - 09 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to Resource Geology & the Mining Cycle	Module 1 (available on the unit website).	

Week 2 - 16 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Resource Geology: Economic Minerals and Energy	Module 1 (available on the unit website).	

Week 3 - 23 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Ores and Geological Settings	Module 2 (available on the unit website).	

Week 4 - 30 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Ores and Geological Settings	Module 2 (available on the unit website).	

Week 5 - 06 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to Prospecting and Exploration Socio-environmental, community and indigenous engagement in natural resource industry.	Module 3 (available on the unit website). Module 4 (available on the unit website).	Assignment 1 Due: Week 5 Wednesday (8 Apr 2020) 12:00 pm AEST

Vacation Week - 13 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
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Week 6 - 20 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
Prospecting and Exploration Socio-environmental, community and indigenous engagement during the exploration phase.	Module 3 (available on the unit website). Module 4 (available on the unit website).	

Week 7 - 27 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
Prospecting and Exploration	Module 3 (available on the unit website).	

Week 8 - 04 May 2020		
Module/Topic	Chapter	Events and Submissions/Topic
Geological Sampling 1	Module 5 (available on the unit website).	Assignment 2 Due: Week 8 Friday (8 May 2020) 12:00 pm AEST
Week 9 - 11 May 2020		
Module/Topic	Chapter	Events and Submissions/Topic
Geological Sampling 2	Module 5 (available on the unit website).	
Week 10 - 18 May 2020		
Module/Topic	Chapter	Events and Submissions/Topic
Geological Sampling & Grade Control	Module 5 (available on the unit website).	
Week 11 - 25 May 2020		
Module/Topic	Chapter	Events and Submissions/Topic
Geological Modelling	Module 6 (available on the unit website).	Assignment 3 Group Work Due: Week 11 Wednesday (27 May 2020) 9:00 am AEST
Week 12 - 01 Jun 2020		
Module/Topic	Chapter	Events and Submissions/Topic
Resource Estimation	Module 7 (available on the unit website).	
Review/Exam Week - 08 Jun 2020		
Module/Topic	Chapter	Events and Submissions/Topic
		Assignment 4 Due: Review/Exam Week Friday (12 June 2020) 12:00 pm AEST
Exam Week - 15 Jun 2020		
Module/Topic	Chapter	Events and Submissions/Topic

Term Specific Information

You will require a rock and mineral kit to undertake your first assessment item. Details on procuring a kit can be obtained on the unit's Moodle site.

Assessment Tasks

1 Assignment 1

Assessment Type

Written Assessment

Task Description

This assessment item tests your knowledge on Modules 1 and 2.

Part A (100 Marks)

Choose 5 of the major geological settings you have learnt about.

1. Briefly describe each of the major geological settings chosen (geological origin/s, mode of formation and host rock/s, geological ages) (50 marks)
2. Provide an example of a mine\deposit from each of these geological settings, the name/s of the major shareholding company, the geographic location (include State or Territory) for each mine site and the current URL link for each mine's web site. (10 marks)
3. Specify the major types of ore minerals found at each of these mines\deposits. (5 marks)

4. The major commercial uses of the main ores extracted from each of these mines. (10 marks)
5. Specify how you would identify the key properties of these ore minerals in hand specimen (Tabulate). (25 marks)
6. Illustrate and annotate your answers, where appropriate.

Part B (100 marks)

You will also need to submit an application to acquire a rock and mineral kit at the start of this unit in Term 1. The application form can be uploaded from the unit's Moodle site. You will be required to identify and characterise the common ore minerals in your kit by their field properties i.e. from hand specimens provided. Your answers are to be inputted into a table. Do illustrate your answers with well annotated diagrams of your ores.

Researching the answers to these questions will require extensive Internet searches. You will need to look beyond the Study Guide for answers. Please ensure that you only use reputable sites, for example Government web sites and professional bodies. Do cite the source of all external information utilised using the Harvard referencing system. Please upload your file/s in Word (.doc or .docx) format so that we can readily open and mark the file/s with our online marking tools.

Further support and information to assist you will be provided during the weekly Zoom tutorial sessions.

Assessment Due Date

Week 5 Wednesday (8 Apr 2020) 12:00 pm AEST

Submit electronically via Moodle with your name, unit code and assignment number i.e. NAME_ENAR11001_Assignment 1

Return Date to Students

Week 7 Monday (27 Apr 2020)

Assignments will be returned with feedback within two weeks.

Weighting

25%

Minimum mark or grade

To Pass this unit you must submit all assessment items (assignments) and obtain a minimum of 40% for any single assessment item (assignment) and must obtain an overall grade of 50% or more on all assessment items (assignments)

Assessment Criteria

Assessment criteria will be based on:

- Presentation and layout i.e. the general appearance and style of the document, attention to document detail and quality to provide a legible, professional looking document
- Effective written communication skills i.e. are clear, coherent and succinct that demonstrate an understanding of content
- Content. This includes the accuracy and relevance of answers, application of knowledge, language and grammar used in answering the questions
- Evidence of both sourcing and researching relevant material beyond that in the Study Guide material provided e.g. reputable internet sites
- Use of: "in text " referencing; appropriately cited figures and tables; and a complete reference or bibliographic list at the end of the assignment. All referencing is to be undertaken using the Harvard System.

Referencing Style

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

Submission

Online

Submission Instructions

Submit electronically via Moodle with your name, unit code and assignment number e.g. NAME_ENAR11001_Assignment_ !

Learning Outcomes Assessed

- Discuss the fuel, ore and industrial mineral resources in Australia.
- Identify and describe fuel, ore and industrial minerals and the typical characteristics of such mineral deposits.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Team Work

- Information Technology Competence
- Cross Cultural Competence
- Ethical practice

2 Assignment 2

Assessment Type

Written Assessment

Task Description

This assessment item tests your knowledge on Modules 3 & 4.

1. As a junior geologist you have been asked by the exploration manager to assist with the implementation of a newly approved Greenfield project, finding either coal or a base metal (do specify). Your task prior to going out into the field is to briefly outline the sequence of pre field work tasks to be undertaken i.e. the pre-exploration sequence. (20 marks)
2. An important undertaking is to ensure that you are aware of community, indigenous and environmental issues, legislation and constraints prior to undertaking the prospecting and exploration phases. Elaborate on what this entails. (20 marks)
3. Provide an overview of the major geophysical methods utilised to locate base metals and why you chose these methods. Provide examples from the literature and illustrate your work with appropriately annotated diagram/s. (20 marks).
4. Describe the major down-hole geophysical methods utilised in the coal industry. Provide examples from the literature where these have been utilized and illustrate your work with appropriately annotated diagrams. (20 marks)
5. Outline the principal geochemical techniques you would apply to find a base metal e.g. gold. Provide examples from the literature where these have been utilized and illustrate your work with appropriately annotated diagrams. (20 marks).

Researching the answers to questions will require extensive Internet searches. You will need to look beyond the Study Guide for answers. Please ensure that you only use reputable sites, for example Government web sites and professional bodies. Do cite the source of all external information utilised using the Harvard referencing system.

Please upload your file/s in Word (.doc or .docx) format so that we can readily open and mark the file/s with our online marking tools.

Further support and information to assist you will be provided during the weekly Zoom tutorial sessions.

Assessment Due Date

Week 8 Friday (8 May 2020) 12:00 pm AEST

Submit electronically via Moodle with your name, unit code and assignment number e.g. ENAR11001 Assignment 2

Return Date to Students

Week 10 Friday (22 May 2020)

Assignments will be returned with feedback within two weeks.

Weighting

25%

Minimum mark or grade

To Pass this unit you must submit all assessment items (assignments) and obtain a minimum of 40% for any single assessment item (assignment) and must obtain an overall grade of 50% or more on all assessment items (assignments).

Assessment Criteria

The assessment will be based on:

- Presentation and layout i.e. the general appearance and style of the document, attention to detail and quality to provide a legible, professional looking document
- Effective written communication skills i.e. are clear, coherent and succinct that demonstrate an understanding of content
- Content. This includes the accuracy and relevance of answer, application of knowledge, language and grammar used in answering questions
- Evidence of sourcing and referencing relevant material beyond that provided in the Study Guide material
- Use of "in text" referencing, appropriately cited figures and tables, a complete reference or bibliographic list at the end of the assignment. All referencing is to be undertaken using the Harvard System.

Referencing Style

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

Submission

Online

Submission Instructions

Submit electronically via Moodle with your name, unit code and assignment number e.g. NAME_ENAR11001_Assignment_2

Learning Outcomes Assessed

- Describe mineral exploration methods and their application.
- Describe processes used to evaluate and quantify mineral reserves.

Graduate Attributes

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

3 Assignment 3 Group Work

Assessment Type

Presentation

Task Description

Your exploration team (Group Work) has been asked to prepare a program for finding a Greenfield Prospect and to geologically evaluate the deposit. You can choose any (one only) of the bulk mineral commodities, base metals, gems and precious metals, speciality metals, industrial minerals, industrial rocks or energy commodities as your focus.

The presentation (Group Work) should include:

1. a description of the geological setting/s (10 marks),
2. the type of background information you will need to acquire (10 marks),
3. a knowledge of environmental and cultural issues and constraints. Show how you would work towards obtaining culturally and environmentally sensitive outcomes. (20 marks),
4. the geophysical method/s you will apply and the geochemical survey/s you will undertake (20 marks).
5. the type of samples you would take and your QA/QC for the sampling. (20 marks)
6. the type of geological model you have developed for the commodity being evaluated. (20 marks).

This Group Work assessment item tests your knowledge on Modules 3, 4, 5 and 6. Class members will be assigned to groups during the first two weeks of undertaking this unit in Term 2. As group members you need to be able to allocate tasks to others within your group, to share and or pool information and for the group to submit a cohesive, professional presentation to your peers i.e. decide amongst your group an equitable division of project tasks. It is recommended that you start to gather the preparatory information and communicate this to group members at an early stage during the term via the 24/7 Zoom system, Skype, group forums and email.

This assessment item will take the form of a Presentation. You will be required to present a live PowerPoint presentation to your client (your lecturer and other unit participants) via a Zoom session during week 11. The presentation will be ½ hour duration with 10 minutes of question time allocated. The mark awarded (for the group) besides being based on factual content, presentation skills, will also include how well you verbally answered the questions posed by the client and other participants. Note, you are required to submit your PowerPoint file to your lecturer A DAY PRIOR to your group's presentation.

Further support and information to assist you will be provided during the weekly Zoom tutorial sessions.

Assessment Due Date

Week 11 Wednesday (27 May 2020) 9:00 am AEST

Submit electronically via Moodle with your name, unit code and assignment number e.g. NAME_ENAR11001_Assignment_3

Return Date to Students

Review/Exam Week Wednesday (10 June 2020)

Assignments will be returned with feedback within two weeks.

Weighting

20%

Minimum mark or grade

To Pass this unit you must submit all assessment items (assignments) and obtain a minimum of 40% for any single assessment item (assignment) and must obtain an overall grade of 50% or more on all assessment items (assignments).

Assessment Criteria

The assessment criteria for each group's presentation will be based on:

- Presentation and layout i.e. the general appearance and style of the PowerPoint presentation to provide a professional talk.
- Effective written communication skills i.e. are clear, coherent and succinct that demonstrate an understanding of content
- Content. This includes the accuracy and relevance of answer, application of knowledge, language and grammar used in answering questions
- Evidence of sourcing and referencing relevant material beyond that provided in the Study Guide material

Referencing Style

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

Submission

Online Group

Submission Instructions

Submit electronically via Moodle as with your name, unit code and assignment number e.g. ENAR11001 Assignment 3

Learning Outcomes Assessed

- Identify and describe fuel, ore and industrial minerals and the typical characteristics of such mineral deposits.
- Describe mineral exploration methods and their application.
- Describe processes used to evaluate and quantify mineral reserves.
- Prepare project reports and demonstrate an effective, professional level of teamwork and communication and support collaborative peer group learning.

Graduate Attributes

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

4 Assignment 4

Assessment Type

Written Assessment

Task Description

This assessment item tests your knowledge on Modules 5, 6 and 7. This Individual Assessment Item 4 is a follow-on from the Presentation, Assessment Item 3 (Group Work), and should include the peer feedback derived thereof.

1. Your exploration team has finished their project by drilling targets determined in the geological model and the results are now available for a public report. Outline what is required to be a competent person under the JORC Code to be the author of the report. (10 marks)
2. Explain what terminology can be used for the type of public report that is to be presented. Use the terminology of JORC Fig 1 to name the category. (25 marks)
3. To meet the requirements for a JORC report use your exploration results to fill out the JORC Table 1 (A Check-list of assessment and reporting criteria). (50 marks)
4. Do make references to case studies in your assignment which may be similar to the model for the exploration project. (10 marks).

Researching the answers to questions will require extensive Internet searches. You will need to look beyond the Study Guide for answers. Please ensure that you only use reputable sites, for example Government web sites and professional bodies. Do cite the source of all external information utilised using the Harvard referencing system.

Please upload your file/s in either Word (.doc or .docx) or PDF formats so that we can readily open and mark the file/s with our online marking tools.

Further support and information to assist you will be provided during the weekly Zoom tutorial sessions.

Assessment Due Date

Review/Exam Week Friday (12 June 2020) 12:00 pm AEST

Submit electronically via Moodle with your name, unit code and assignment number e.g.

NAME_ENAR11001_Assignment_4

Return Date to Students

Exam Week Friday (19 June 2020)

Assignments will be returned with feedback within two weeks.

Weighting

30%

Minimum mark or grade

To Pass this unit you must submit all assessment items (assignments) and obtain a minimum of 40% for any single assessment item (assignment) and must obtain an overall grade of 50% or more on all assessment items (assignments).

Assessment Criteria

The assessment will be based on:

- Presentation and layout i.e. the general appearance and style of the document, attention to detail and quality to provide a legible, professional looking document
- Effective written communication skills i.e. are clear, coherent and succinct that demonstrate an understanding of content
- Content. This includes the accuracy and relevance of answer, application of knowledge, language and grammar used in answering questions
- Evidence of sourcing and referencing relevant material beyond that provided in the Study Guide material
- Use of "in text" referencing, appropriately cited figures and tables, a complete reference or bibliographic list at the end of the assignment. All referencing is to be undertaken using the Harvard System.

Referencing Style

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

Submission

Online

Submission Instructions

Submit electronically via Moodle with your name, unit code and assignment number i.e.

NAME_ENAR11001_Assignment_4

Learning Outcomes Assessed

- Identify and describe fuel, ore and industrial minerals and the typical characteristics of such mineral deposits.
- Describe mineral exploration methods and their application.
- Describe processes used to evaluate and quantify mineral reserves.
- Prepare project reports and demonstrate an effective, professional level of teamwork and communication and support collaborative peer group learning.

Graduate Attributes

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