ENAR12015 *Structural Geology and Sedimentology*
Term 2 - 2022

Profile information current as at 30/04/2024 08:40 am

General Information

Overview
This unit combines structural geology and sedimentology through recognising, interpreting, and classifying major geological structures and sedimentary rocks. You will discuss the implications of rock structures for engineering and mining operations. You will also interpret geological field sections and maps and describe the sedimentology of terrestrial, coastal, deep and shallow marine environments. This unit will develop your software skills in Queensland Globe and CoalLog, or equivalent. You must complete compulsory practical activities. Refer to the Engineering Undergraduate Course Moodle site for proposed dates and locations.

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
PHYG12003 Geological Science OR ENAR12016 Earth 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 2 - 2022

No offerings for ENAR12015

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).

Residential Schools
This unit has a Compulsory Residential School for distance mode students and the details are:
Click here to see your Residential School Timetable.

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. **Group Work**
Weighting: 20%
3. **Written Assessment**
Weighting: 20%
4. **Practical and Written Assessment**
Weighting: 40%

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 Self reflection

Feedback

To seek new resources (laboratory and field) for when students resume taking this unit.

Recommendation

To lobby management for new resources.

Unit Learning Outcomes

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

1. Discuss the processes that create rock structures and the implications of rock structures to engineering and mining operations
2. Interpret geological field sections and maps for the geological structures therein
3. Apply different sedimentary classification schemes and conceptualise various sedimentary environments such as continental, coastal, deep and shallow marine
4. Recognise and apply the principles of stratigraphy
5. Develop and produce professional project reports by demonstrating an effective, professional level of teamwork and communication and support collaborative peer group learning.

These are linked to the fields of knowledge that Mineral Council of Australia para-professionals (MINAD program) are required to attain to complete a MINAD sponsored associate degree.

Alignment of Learning Outcomes, Assessment and Graduate Attributes

— N/A Level | • Introductory Level | • Intermediate Level | • Graduate Level | ◦ Professional Level | ◦ Advanced Level

Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes				
	1	2	3	4	5
1 - Written Assessment - 20%	•				
2 - Written Assessment - 20%			•	•	
3 - Group Work - 20%		•		•	•
4 - Practical and Written Assessment - 40%		•	•		

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes				
	1	2	3	4	5
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					

Textbooks and Resources

Textbooks

ENAR12015

Prescribed

Sedimentology and Stratigraphy
Edition: Second (2009)
Authors: Nichols, G
Wiley - Blackwell
Chichester , West Sussex , United Kingdom
ISBN: 978-1-4051-9379-5
Binding: Paperback
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Prescribed

Structural Geology
Edition: 2 (2016)
Authors: Fossen, H
Cambridge
Cambridge , Cambridge , United Kingdom
ISBN: 9781107057647
Binding: Paperback
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Supplementary

CQU Lab kit
Edition: Version X (2021)
School of Engineering & Technology
Binding: Other

View textbooks at the CQUniversity Bookshop

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 - 11 Jul 2022

Module/Topic	Chapter	Events and Submissions/Topic

Introduction to Structural Geology & Sedimentology	Readings available on the unit's Moodle website	

Week 2 - 18 Jul 2022

Module/Topic	Chapter	Events and Submissions/Topic
Origin and Transport of Sedimentary Material	Readings available on the unit's Moodle website	

Week 3 - 25 Jul 2022

Module/Topic	Chapter	Events and Submissions/Topic
The Composition, Classification and Description of Sedimentary Rocks	Readings available on the unit's Moodle website	

Week 4 - 01 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
Primary Rock Structures and Diagenesis	Readings available on the unit's Moodle website	

Week 5 - 08 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
Rock Deformation and Unconformities	Readings available on the unit's Moodle website	**Written Assessment 1** Due: Week 5 Friday (12 Aug 2022) 11:59 pm AEST

Vacation Week - 15 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
Non Teaching Week		

Week 6 - 22 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
Stereoscopic Projections and Mapping Residential School	Readings available on the unit's Moodle website	Rockhampton-based Residential School from 25 to 27 August in Week 6.

Week 7 - 29 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
Faults, Folds and Folding	Readings available on the unit's Moodle website	

Week 8 - 05 Sep 2022

Module/Topic	Chapter	Events and Submissions/Topic
Lineations, Foliations and Cleavage	Readings available on the unit's Moodle website	**Written Assessment - Group Work During Residential School** Due: Week 8 Friday (9 Sept 2022) 11:59 pm AEST

Week 9 - 12 Sep 2022

Module/Topic	Chapter	Events and Submissions/Topic
Joints and Shear Fractures	Readings available on the unit's Moodle website	

Week 10 - 19 Sep 2022

Module/Topic	Chapter	Events and Submissions/Topic
Depositional Environments and Facies	Readings available on the unit's Moodle website	**Written Assessment - Structural Geology** Due: Week 10 Friday (23 Sept 2022) 11:59 pm AEST

Week 11 - 26 Sep 2022

Module/Topic	Chapter	Events and Submissions/Topic
Stratigraphy and Basin Analysis	Readings available on the unit's Moodle website	

Week 12 - 03 Oct 2022

Module/Topic	Chapter	Events and Submissions/Topic
Unit Review and Completion of Assessment Items	Readings available on the unit's Moodle website	

Review/Exam Week - 10 Oct 2022

Module/Topic	Chapter	Events and Submissions/Topic
		Individual Practical and Written Assessment Due: Review/Exam Week Friday (14 Oct 2022) 11:59 pm AEST

Exam Week - 17 Oct 2022

Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 Written Assessment 1

Assessment Type
Written Assessment

Task Description
Sedimentology & Structural Geology
Part A: (90 marks)
You are a graduate geoscientist about to undertake your first core-logging assignment with your new employer, a major mining company. Describe how you would:

- undertake the lithological descriptions of clastic and non-clastic sedimentary rocks in cores i.e. what are the core logging procedures and techniques you would use to describe your cores;
- utilize stratigraphic principles and techniques to describe the stratigraphic succession (show diagrams where appropriate);
- recognize and assess some of the more common sedimentary structures that you are likely to find in these cores (show diagrams where appropriate);
- recognize specific types of sedimentary structures that could have engineering geology implications for mining activities e.g. geohazards.

Your answer should include a flow diagram (figure) outlining the logical sequencing of tasks you will undertake to complete this. Illustrate your answers, where appropriate with diagrams and tables. Ensure that you adequately describe each task performed and adequately define the geological terms you use e.g. sorting, texture, maturity, anticline etc. All tables and figures utilized from the literature are to be suitably referenced using the Harvard System.

Part B: (10 marks)
From Part A extract tables and figures to produce:

- a check-list and
- a geological field wallet

that you could take out into the field with you to assess these sedimentary sequences. Ensure that you reference the source/s of this information adequately. You will require this field wallet during your Residential School.
You will need to look beyond the reading material provided for answers. Please ensure that you only use reputable sites, for example, Government websites and professional bodies. Do cite the source/s of all external information utilized 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.
Note: Further support on writing style and referencing is provided on the Moodle site for this unit and will be discussed during weekly Zoom Tutorials.

Assessment Due Date
Week 5 Friday (12 Aug 2022) 11:59 pm AEST
Submit electronically via Moodle with your name, unit code and assignment number i.e. NAME_ENAR12015_Assignment_1

Return Date to Students

Returned electronically or via Moodle as ENAR12015 Assignment 1 Marked

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 will be based on:

- Presentation and layout i.e. the general appearance and style of the report, attention to detail and quality to provide a legible, professional looking report
- 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 material
- Showing the requisite equations and using the appropriate SI units and symbols
- All steps and workings to calculations, if required, to be submitted to show how an answer was derived
- Use of “in-text citations", 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 as a MS Word file via Moodle with your name, unit code and assignment number i.e. NAME_ENAR12015_Assignment_1

Learning Outcomes Assessed

- Discuss the processes that create rock structures and the implications of rock structures to engineering and mining operations

2 Written Assessment - Group Work During Residential School

Assessment Type
Group Work

Task Description
Class members will be assigned to groups during the 3 day Residential School in Week 6 (24 to 26 August). Groups will utilize a range of specialist sedimentological and structural geology equipment and software to undertake laboratory and field based tasks. These tasks, along with equipment and software training, will be undertaken during the Residential School. A group submission will be required once the field and equipment derived data has been analyzed, interpreted and discussed after the laboratory and field sessions. Further details about the group-based assessment items will be provided during the start of the Residential School and placed on Moodle. Some resources, access to drill cores, equipment and field sites are still to be finalized with outside organizations and providers and is subject to availability and access during the Residential School. If for some unforeseen reason this were to become unavailable during the Residential School, the lecturer will source alternative equipment and resources.
As group members you need to be able to allocate tasks to others within your group, to share and pool information and for the group to submit a cohesive, professional report.
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.

Assessment Due Date
Week 8 Friday (9 Sept 2022) 11:59 pm AEST
Submit electronically via Moodle with your name, unit code and assignment number i.e. NAME_ENAR12015_Assignment_2

Return Date to Students

Returned electronically or via Moodle as ENAR12015 Assignment 2 Marked

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
No Assessment Criteria

Referencing Style

- Harvard (author-date)

Submission
Online

Submission Instructions
Submit electronically as a MS Word file via Moodle with your name, unit code and assignment number i.e. NAME_ENAR12015_Assignment_2

Learning Outcomes Assessed

- Interpret geological field sections and maps for the geological structures therein
- Recognise and apply the principles of stratigraphy
- Develop and produce professional project reports by demonstrating an effective, professional level of teamwork and communication and support collaborative peer group learning.

3 Written Assessment - Structural Geology

Assessment Type
Written Assessment

Task Description
This assessment item tests your knowledge of structural geology and rock deformation. This will take the form of a series of short answers to questions, stereoscopic projections and calculations and some structural geology mapping exercises. The structural maps, stereoscopic diagrams and software can be accessed from the Moodle site.
Training in the use of stereoscopic projections, calculations and software use will be undertaken during the Residential School (Week 6) and during associated lectures and tutorials. Data for some exercises will be collected during the Residential School's field mapping exercises in structural geology. Data interpretation will be undertaken during weekly Zoom Tutorial sessions.
You will need to look beyond the study material provided for some 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 utilized 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.

Assessment Due Date
Week 10 Friday (23 Sept 2022) 11:59 pm AEST
Submit electronically via Moodle with your name, unit code and assignment number i.e. NAME_ENAR12015_Assignment_3

Return Date to Students

Returned electronically or via Moodle as ENAR12015 Assignment 3 Marked

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 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 and Residential School 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 as a MS Word file via Moodle with your name, unit code and assignment number i.e. NAME_ENAR12015_Assignment_3

Learning Outcomes Assessed

- Apply different sedimentary classification schemes and conceptualise various sedimentary environments such as continental, coastal, deep and shallow marine
- Recognise and apply the principles of stratigraphy

4 Individual Practical and Written Assessment

Assessment Type
Practical and Written Assessment

Task Description
Data collection for this assessment item will be undertaken during the 3-day Residential School as a combination of practical and theoretical tasks based on field and laboratory measurements, observations and mapping. After data manipulation and interpretation, some aspects of which will require customized software, a formal report will need to be submitted for assessment. Details will be provided during the Residential School as well as being placed on the unit's Moodle site. This assessment item requires access to equipment and resources from external parties and is subject to availability and access during the Residential School. If for some unforeseen reason this were to become unavailable during the Residential School, the lecturer will source alternative equipment and resources.
Researching the answers to field and laboratory analyses will require extensive Internet searches. Please ensure that you only use reputable sites, for example, Government websites and professional bodies. Do cite the source of all external information utilized 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.

Assessment Due Date
Review/Exam Week Friday (14 Oct 2022) 11:59 pm AEST
Submit electronically via Moodle with your name, unit code and assignment number i.e. NAME_ENAR12015_Individual Assignment_4

Return Date to Students

Returned electronically or via Moodle as ENAR12015 Assignment 4 Marked

Weighting
40%

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 will be based on:

- Presentation and layout i.e. the general appearance and style of the report, attention to detail and quality to provide a legible, professional looking report
- 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 material
- Showing the requisite equations and using the appropriate SI units and symbology
- All steps and workings to calculations to be submitted to show how an answer was derived
- Use of “in-text citations", 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_ENAR12015_Assignment_4

Learning Outcomes Assessed

- Interpret geological field sections and maps for the geological structures therein
- Apply different sedimentary classification schemes and conceptualise various sedimentary environments such as continental, coastal, deep and shallow marine

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