



ENEC14018 *Disaster Resilient Infrastructure*

Term 1 - 2024

Profile information current as at 30/04/2024 12:33 pm

All details in this unit profile for ENEC14018 have been officially approved by CQUniversity 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

In this unit, you will analyse the physical characteristics of natural and man-made disasters to identify the mechanisms of destruction and the potential damages from an engineering viewpoint. You will consider the stakeholders and necessary framework relevant to the disaster management including necessary training and preparation for the investigators. You will learn to make recommendations to current disaster management plans to improve the access to critical infrastructure in the aftermath of a disaster. You will also investigate possible modifications of the relevant statutory frameworks, standards and infrastructure management plans to improve the community preparedness and resilience to disaster.

Details

Career Level: *Undergraduate*

Unit Level: *Level 4*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

Pre-requisites: ENEC12010, ENEC12011, ENEC13015

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 - 2024

No offerings for ENEC14018

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. **Case Study**

Weighting: 40%

2. **Report**

Weighting: 60%

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](#).

Unit Learning Outcomes

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

1. Identify the risk to infrastructure associated with a disaster
2. Analyse the infrastructure for disaster resilience using engineering principles and fundamentals
3. Recommend improvements in design and management of infrastructure to improve post-disaster recovery
4. Promote principals of sustainable development while applying ethical practices and stakeholder requirements
5. Apply effective communication, creativity, time management and collaborative skills to work and learn individually and in a team.

The Learning Outcomes for this unit are linked with the Engineers Australia Stage 1 Competency Standards for Professional Engineers in the areas of 1. Knowledge and Skill Base, 2. Engineering Application Ability and 3. Professional and Personal Attributes at the following levels:

Introductory 3.5 Orderly management of self, and professional conduct. (LO: 4N)

Intermediate 1.1 Comprehensive, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline. (LO: 2I 3I) 1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline. (LO: 2I 3I) 1.4 Discernment of knowledge development and research directions within the engineering discipline. (LO: 1N 2I 3I 4N) 1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline. (LO: 1N 2I 3I) 2.1 Application of established engineering methods to complex engineering problem solving. (LO: 1I 2I 3I) 2.2 Fluent application of engineering techniques, tools and resources. (LO: 2I 3I) 3.3 Creative, innovative and pro-active demeanour. (LO: 3I) 3.4 Professional use and management of information. (LO: 1I 3N 4N) 3.6 Effective team membership and team leadership. (LO: 1N 3I 4N 5I)

Advanced 1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline. (LO: 2A 3I) 1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline. (LO: 2A 3A) 2.3 Application of systematic engineering synthesis and design processes. (LO: 3A) 3.1 Ethical conduct and professional accountability. (LO: 1N 3I 4A) 3.2 Effective oral and written communication in professional and lay domains. (LO: 1I 4I 5A)

Note: LO refers to the Learning Outcome number(s) which link to the competency and the levels: N - Introductory, I - Intermediate and A - Advanced.

Refer to the Engineering Undergraduate Course Moodle site for further information on the Engineers Australia's Stage 1 Competency Standard for Professional Engineers and course level mapping information <https://moodle.cqu.edu.au/course/view.php?id=1511>

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes				
	1	2	3	4	5
1 - Case Study - 40%	•	•		•	•

Assessment Tasks	Learning Outcomes				
	1	2	3	4	5
2 - Report - 60%		•	•	•	•

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					

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
1 - Case Study - 40%	•	•	•	•	•			•	•	
2 - Report - 60%	•	•	•	•	•			•	•	

Textbooks and Resources

Textbooks

ENEC14018

Supplementary

Disaster Resilience and Sustainability

1st Edition (2022)

Authors: Editors: Saeid Eslamian and Faezeh Eslamian

Springer Cham

ISBN: 978-3-030-72196-1

Binding: eBook

IT Resources

You will need access to the following IT resources:

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

Referencing Style

No referencing style set.

Teaching Contacts

Kumaran Suntharavadivel Unit Coordinator

t.suntharavadivel@cqu.edu.au

Schedule

Week 1 - 04 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Understanding Disasters and Their Impact on Society		

Week 2 - 11 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Understanding different disasters and associated risks		
• Natural Disasters		
• Man-made Disasters		

Week 3 - 18 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Evaluating Damages after the Disasters - Risks and Challenges		

Week 4 - 25 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Managing Public Safety and Reducing Potential Health Risks		

Week 5 - 01 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Effect on Supply Chain

- Essential supply to the affected area
- Business concerns
- Need for urgent restoration of damages

Vacation Week - 08 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Week 6 - 15 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Managing Disaster Risks and Preparing the Community I

- Pre-disaster management
- Post-disaster Management

Case Study Due: Week 6 Tuesday (16 Apr 2024) 5:00 pm AEST

Week 7 - 22 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Managing Disaster Risks and Preparing the Community II

- The complexity of disaster management
- Existing pre-disaster management tools
- Real-time disaster management

Week 8 - 29 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Evaluating the Long-term Impact on Community and their Livelihood

Week 9 - 06 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Disaster Resilience - Building a Better Society from the Past Experiences

- Learning from past disasters
- Translate the challenges to discoveries/frameworks

Week 10 - 13 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Developing Framework for Community Resilience I

- Identifying stakeholders of a community disaster resilience framework
- Importance of practical framework

Week 11 - 20 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Developing Framework for Community Resilience II

- Understanding of project cycle (analysis, formulation, implementation and evaluation) and Lines of resilience (Infrastructure, Community, Economy, and Environment)

Week 12 - 27 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Challenges to Disaster Management and Resilience

Review/Exam Week - 03 Jun 2024

Module/Topic	Chapter	Events and Submissions/Topic
		Disaster Resilience Report Due: Review/Exam Week Monday (3 June 2024) 5:00 pm AEST

Exam Week - 10 Jun 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Assessment Tasks

1 Case Study

Assessment Type

Case Study

Task Description

You will be given a disaster event. Based on this you are required to prepare a report that explains the following.

- Nature of the disaster
- Risks and Challenges Faced on Disaster Assessment
- Management of Public Safety and Health Risks
- Lessons learned

Work Limit: 2000 words (excluding references)

Assessment Due Date

Week 6 Tuesday (16 Apr 2024) 5:00 pm AEST

Return Date to Students

Week 8 Tuesday (30 Apr 2024)

Weighting

40%

Minimum mark or grade

25%

Assessment Criteria

The submission will be assessed based on the following criteria:

- A comprehensive description of disaster and impacts [05 marks]
- Critical analysis of challenges and risks [10 marks]
- Critical analysis of the management of public health risks [10 marks]
- Logical articulation of lesson-learnt [10 marks]
- Tidiness, reference list and presentation [05 marks]

Submission

Online

Learning Outcomes Assessed

- Identify the risk to infrastructure associated with a disaster
- Analyse the infrastructure for disaster resilience using engineering principles and fundamentals
- Promote principals of sustainable development while applying ethical practices and stakeholder requirements
- Apply effective communication, creativity, time management and collaborative skills to work and learn individually and in a team.

Graduate Attributes

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

- Social Innovation

2 Disaster Resilience Report

Assessment Type

Report

Task Description

You will be given a disaster event. Based on this you are required to prepare a Disaster Resilience Report that contains the following details.

- Nature of the disaster
- Evaluating Risk (community risk and impact on supply chain)
- How to Management of Public Safety and Health Risks
- Prepare for the Disaster (Pre-disaster and Post-Disaster)
- Possible Challenges

Assessment Due Date

Review/Exam Week Monday (3 June 2024) 5:00 pm AEST

Return Date to Students

Exam Week Friday (14 June 2024)

Weighting

60%

Minimum mark or grade

50%

Assessment Criteria

The submission will be assessed based on the following criteria:

- A comprehensive description of disaster [05 marks]
- Evaluation of challenges and risks [10 marks]
- Clear management plan for public health risks [10 marks]
- Identification Stakeholders of Disaster Management [05 marks]
- Logical Resilience Plan [15 marks]
- Identification of challenges [10 marks]
- Tidiness, reference list and presentation [05 marks]

Word Limit: 2500 Words (excluding references)

Submission

Online

Learning Outcomes Assessed

- Analyse the infrastructure for disaster resilience using engineering principles and fundamentals
- Recommend improvements in design and management of infrastructure to improve post-disaster recovery
- Promote principals of sustainable development while applying ethical practices and stakeholder requirements
- Apply effective communication, creativity, time management and collaborative skills to work and learn individually and in a team.

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Team Work
- Ethical practice
- Social Innovation

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