ENEG13002 *Engineering Futures*
Term 2 - 2023

Profile information current as at 14/12/2025 03:38 pm

General Information

Overview
The rapid development of technology continually influences and challenges how engineers practice. In this unit, you will learn about cutting-edge engineering projects incorporating multi-disciplinary teams, innovative methods to advance the United Nation's Sustainable Development Goals, and the application of big data, artificial intelligence, and the Internet of Things. The unit will also present future expectations for practicing engineers such as becoming a Registered Professional Engineer, understanding risk management in a changing world, complying with legislation, and promoting safety in engineering design and workplace operations.

Details
Career Level: *Undergraduate*
Unit Level: *Level 3*
Credit Points: *6*
Student Contribution Band: *8*
Fraction of Full-Time Student Load: *0.125*

Pre-requisites or Co-requisites
Prerequisite: ENEG11007 Industry Project Investigation OR ENEG12007 Creative Engineering.
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 - 2023

- Bundaberg
- Cairns
- Gladstone
- Mackay
- Online
- Rockhampton

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. **Online Quiz(zes)**
Weighting: 20%
2. **Online discussion forum**
Weighting: 30%
3. **Report**
Weighting: 50%

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 professional memberships and state registrations necessary to achieve career aspirations
2. Discuss functional safety, safety in design, and the compliance of a complex engineering project with legislation, guidelines, and Australian Standards
3. Evaluate risk management processes and safe work practices applied in a complex engineering project
4. Examine advances in engineering practice incorporating applications of big data, artificial intelligence, or the Internet-of-things
5. Evaluate the contributions of an engineering project to the United Nations sustainable development goals
6. Identify opportunities to enhance current engineering practice by applying advanced technologies adopted in cutting-edge engineering projects.
7. Provide evidence of a professional capacity to work, learn, and communicate effectively in a multi-disciplinary 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:

Intermediate

1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline. (LO: 2N 6I)
2.3 Application of systematic engineering synthesis and design processes. (LO: 2N 3N 5N 6I)

Advanced

1.1 Comprehensive, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline. (LO: 4I 6A)
1.4 Discernment of knowledge development and research directions within the engineering discipline. (LO: 2A 3A 4A 5A 6A)
1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline. (LO: 2A 6A)
1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline. (LO: 2I 3I 4A 5A 6A)
2.1 Application of established engineering methods to complex engineering problem solving. (LO: 2I 6A)
2.2 Fluent application of engineering techniques, tools and resources. (LO: 2I 3I 4I 6A)
2.4 Application of systematic approaches to the conduct and management of engineering projects. (LO: 2I 3I 4I 5I 6A 7A)
3.1 Ethical conduct and professional accountability. (LO: 1I 2A 6A 7A)
3.2 Effective oral and written communication in professional and lay domains. (LO: 2A 3A 4A 5A 6A 7A)
3.3 Creative, innovative, and proactive demeanor. (LO: 2I 3I 4I 5A 6A 7A)
3.4 Professional use and management of information. (LO: 2A 3A 4A 5A 6A)
3.5 Orderly management of self, and professional conduct. (LO: 1A 4A 5A 6A 7A)
3.6 Effective team membership and team leadership. (LO: 4A 5A 6A 7A)

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 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

— 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	6	7
1 - Online Quiz(zes) - 20%	•						
2 - Online discussion forum - 30%		•	•				
3 - Report - 50%				•	•	•	•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes						
	1	2	3	4	5	6	7
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

There are no required textbooks.

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

Kianoush Emami Unit Coordinator
k.emami@cqu.edu.au
Benjamin Taylor Unit Coordinator
ben.taylor@cqu.edu.au

Schedule

Week 1 - 10 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
Unit introduction	Refer to Moodle for the unit contents	

Week 2 - 17 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
Suggested professional memberships	Refer to Moodle for the unit contents	

Week 3 - 24 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
Engineers Australia and the RPEQ Process	Refer to Moodle for the unit contents	

Week 4 - 31 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
Registered Professional Engineer of Queensland (RPEQ) and experience in applying and working	Refer to Moodle for the unit contents	

Week 5 - 07 Aug 2023

Module/Topic	Chapter	Events and Submissions/Topic
Overview of executing the design, construction, and operation processes in a complex multi-disciplinary project	Refer to Moodle for the unit contents	**Professional Membership Quiz** Due: Week 5 Friday (11 Aug 2023) 10:00 pm AEST

Vacation Week - 14 Aug 2023

Module/Topic	Chapter	Events and Submissions/Topic

Week 6 - 21 Aug 2023

Module/Topic	Chapter	Events and Submissions/Topic
Examples of Functional Safety and Safety in Design	Refer to Moodle for the unit contents	Commence Assignment 2 discussion forum participation.

Week 7 - 28 Aug 2023

Module/Topic	Chapter	Events and Submissions/Topic
Examples of compliance with Australian Standards and Legislation	Refer to Moodle for the unit contents	Assignment 2 discussion forum participation.

Week 8 - 04 Sep 2023

Module/Topic	Chapter	Events and Submissions/Topic
An operating perspective on Risk Management and Safe Work Practices	Refer to Moodle for the unit contents	Assignment 2 discussion forum participation.

Week 9 - 11 Sep 2023

Module/Topic	Chapter	Events and Submissions/Topic
Examples of running a plant incorporating big data, AI and complex control systems	Refer to Moodle for the unit contents	**Safety Discussions** Due: Week 9 Friday (15 Sept 2023) 10:00 pm AEST

Week 10 - 18 Sep 2023

Module/Topic	Chapter	Events and Submissions/Topic
Examples of Engineering Projects Working Towards all 17 Sustainable Development Goals	Refer to Moodle for the unit contents	Team Formation and commence team critique and report.

Week 11 - 25 Sep 2023

Module/Topic	Chapter	Events and Submissions/Topic
Student placement compilation of video blogs or guest speakers	Refer to Moodle for the unit contents	Continue team critique.

Week 12 - 02 Oct 2023

Module/Topic	Chapter	Events and Submissions/Topic
Multi-disciplinary and future engineering thesis presentations	Refer to Moodle for the unit contents	Continue team critique.

Review/Exam Week - 09 Oct 2023

Module/Topic	Chapter	Events and Submissions/Topic
		Team Engineering Futures Critique Due: Review/Exam Week Friday (13 Oct 2023) 10:00 pm AEST

Exam Week - 16 Oct 2023

Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 Professional Membership Quiz

Assessment Type
Online Quiz(zes)

Task Description
This assessment task is a single quiz on the professional membership and state registration requirements for practising engineering in Australia.
You may have two attempts with the highest grade recorded in the grade book.

Number of Quizzes
0

Frequency of Quizzes
Other

Assessment Due Date
Week 5 Friday (11 Aug 2023) 10:00 pm AEST

Return Date to Students

Student's receive automated feedback through the quiz.

Weighting
20%

Minimum mark or grade
50%

Assessment Criteria
Full marks are awarded for correct answers.

Submission
Online

Learning Outcomes Assessed

- Identify professional memberships and state registrations necessary to achieve career aspirations

2 Safety Discussions

Assessment Type
Online discussion forum

Task Description
Students must participate in discussion forums on Moodle to share their experience with topics including functional safety, safety in design, compliance with legislation, guidelines and Australian Standards, risk management and safe work practices. This task involves answering questions set by the lecturer and creating a dialogue by responding to other students' posts. It is strongly recommended to start this task early to meet all the marking criteria.

Assessment Due Date
Week 9 Friday (15 Sept 2023) 10:00 pm AEST

Return Date to Students
Week 11 Friday (29 Sept 2023)

Weighting
30%

Minimum mark or grade
50%

Assessment Criteria
A Marking Rubric is provided on Moodle that includes indicators of attainment at the ‘Sound’, ‘Good’ and ‘Excellent’ levels for each component of the assignment.

Submission
Online

Learning Outcomes Assessed

- Discuss functional safety, safety in design, and the compliance of a complex engineering project with legislation, guidelines, and Australian Standards
- Evaluate risk management processes and safe work practices applied in a complex engineering project

3 Team Engineering Futures Critique

Assessment Type
Report

Task Description
Working as a team, you must critique an engineering project's contributions to the United Nations sustainable development goals by examining the advanced technologies adopted that incorporate applications of big data, artificial intelligence, or the Internet-of-things. Your report should include commendations on best practice examples for the future of engineering and recommendations for future improvements. Moodle contains a template to help scaffold your report.

Assessment Due Date
Review/Exam Week Friday (13 Oct 2023) 10:00 pm AEST

Return Date to Students

At the Certification of Grades

Weighting
50%

Minimum mark or grade
50%

Assessment Criteria
A Marking Rubric is provided on Moodle that includes indicators of attainment at the ‘Sound’, ‘Good’ and ‘Excellent’ levels for each component of the assignment.

Submission
No submission method provided.

Learning Outcomes Assessed

- Examine advances in engineering practice incorporating applications of big data, artificial intelligence, or the Internet-of-things
- Evaluate the contributions of an engineering project to the United Nations sustainable development goals
- Identify opportunities to enhance current engineering practice by applying advanced technologies adopted in cutting-edge engineering projects.
- Provide evidence of a professional capacity to work, learn, and communicate effectively in a multi-disciplinary team.

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