



ENEC13014 Water Supply and Wastewater Technology

Term 1 - 2023

Profile information current as at 25/04/2024 07:25 pm

All details in this unit profile for ENEC13014 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 be introduced to water and wastewater treatment, including water distribution systems and wastewater collection systems. The unit will cover characteristics of water and wastewater, different types of treatment processes and the design of different components of water and wastewater treatment plants.

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

Prerequisites: ENEC12010 Hydraulics and Hydrology

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 - 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. **Written Assessment**

Weighting: 30%

2. **Written Assessment**

Weighting: 30%

3. **Online Test**

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 Moodle

Feedback

Students liked the authentic project of the unit.

Recommendation

Assessment item to retain.

Feedback from Self Reflection

Feedback

New assessment types will be investigated to add variety.

Recommendation

Having multiple types of assessment would expose students to different situations that are likely in their professional life.

Unit Learning Outcomes

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

1. Characterise the quality parameters of potable water and wastewater
2. Formulate a preliminary design of water and wastewater treatment plants
3. Design water distribution and wastewater collection networks
4. Demonstrate a level of communication expected of professional engineers.

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

1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline. (LO: 2I 3I)

Advanced

1.1 Comprehensive, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline. (LO: 1I 2A 3A)

1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline. (LO: 2A 3A)

1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline. (LO: 1N 2A 3A)

1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline. (LO: 2A 3A)

2.1 Application of established engineering methods to complex engineering problem solving. (LO: 2A 3A)

2.2 Fluent application of engineering techniques, tools and resources. (LO: 2I 3A)

2.3 Application of systematic engineering synthesis and design processes. (LO: 2A 3A)

2.4 Application of systematic approaches to the conduct and management of engineering projects. (LO: 2I 3A)

3.2 Effective oral and written communication in professional and lay domains. (LO: 4A)

3.4 Professional use and management of information. (LO: 4A)

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
1 - Written Assessment - 30%			•	•
2 - Written Assessment - 30%	•	•		•
3 - Online Test - 40%	•	•	•	

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes			
	1	2	3	4
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

ENEC13014

Supplementary

Water and Wastewater Engineering: Design Principles and Practice

(2020)

Authors: Mackenzie L. Davis

McGraw Hill

Columbus , OH , USA

Binding: eBook

ENEC13014

Supplementary

Water and Wastewater Engineering: Water Supply and Wastewater Removal

Edition: 3rd edn (2010)

Authors: Nazih K. Shamma, Lawrence K. Wang

Wiley US

Hoboken , NJ , USA

ISBN: 9780470411926

Binding: eBook

Additional Textbook Information

Textbooks can be accessed online at the CQUniversity Library website. Access may be limited. If you would prefer your own copy, purchase either paper or eBook versions at the CQUni Bookshop here:

<http://bookshop.cqu.edu.au> (search on the Unit code)

IT Resources

You will need access to the following IT resources:

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

Referencing Style

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

For further information, see the Assessment Tasks.

Teaching Contacts

Raj Sharma Unit Coordinator

r.sharma@cqu.edu.au

Schedule

Week 1 - 06 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
Water Sources, storage, and Water Demand		

Week 2 - 13 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
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Water distribution system requirements- standards and guidelines

Week 3 - 20 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
Hydraulics of Water distribution system and use of EPANET		

Week 4 - 27 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
Project I: Modelling of the water distribution system		

Week 5 - 03 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
Wastewater sources and quantity		Design of water distribution system Due: Week 5 Wednesday (5 Apr 2023) 11:45 pm AEST

Vacation Week - 10 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
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Week 6 - 17 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
Hydraulics of sewer design		

Week 7 - 24 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
Sewerage system requirements- standards and guidelines		

Week 8 - 01 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
Project II: Modelling of the wastewater collection system		

Week 9 - 08 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
Water and wastewater Quality		Design and analysis of sewer system Due: Week 9 Wednesday (10 May 2023) 11:45 pm AEST

Week 10 - 15 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
Water treatment		

Week 11 - 22 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
Wastewater Treatment		

Week 12 - 29 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
Revision		Online Test Due: Week 12 Friday (2 June 2023) 10:00 am AEST

Assessment Tasks

1 Design of water distribution system

Assessment Type

Written Assessment

Task Description

You are required to design a water distribution system for a given area. Information related to the project area such as topography and population is provided. You may need to collect relevant information from suppliers, councils and market surveys as appropriate. Additional information on the assignment is available on the Moodle website.

Assessment Due Date

Week 5 Wednesday (5 Apr 2023) 11:45 pm AEST

Return Date to Students

Two weeks after the submission.

Weighting

30%

Minimum mark or grade

50%

Assessment Criteria

The final report will be evaluated based on the followings:

- 1) Use of correct values, make reasonable assumptions as required and follow the standards and guidelines as applicable;
 - 2) Clear demonstration of the modelling steps;
 - 3) Presentation of results;
 - 4) Interpretation of results;
 - 5) Analysis of the results.
 - 6) Communication and teamwork
- See Moodle for the marking rubric.

Referencing Style

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

Submission

Online

Learning Outcomes Assessed

- Design water distribution and wastewater collection networks
- Demonstrate a level of communication expected of professional engineers.

2 Design and analysis of sewer system

Assessment Type

Written Assessment

Task Description

You are required to design a sewer network for a given area. Information related to the project area such as topography and population is provided. You may need to collect relevant information from suppliers, councils and market survey as appropriate. Additional information on the assignment is available on the Moodle website.

Assessment Due Date

Week 9 Wednesday (10 May 2023) 11:45 pm AEST

Return Date to Students

Two weeks after the submission due date.

Weighting

30%

Minimum mark or grade

50%

Assessment Criteria

The final report will be evaluated based on the followings:

- 1) Use of correct values, make reasonable assumptions as required and follow the standards and guidelines as applicable;

- 2) Clear demonstration of the modelling steps;
 - 3) Presentation of results;
 - 4) Interpretation of results;
 - 5) Analysis of the results.
 - 6) Communication and teamwork
- See Moodle for the marking rubric.

Referencing Style

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

Submission

Online

Learning Outcomes Assessed

- Characterise the quality parameters of potable water and wastewater
- Formulate a preliminary design of water and wastewater treatment plants
- Demonstrate a level of communication expected of professional engineers.

3 Online Test

Assessment Type

Online Test

Task Description

This assessment task consists of one Online Test. The main characteristics of the Online Test are:

1. The test will start at 10:00 am AEST Friday of Week 12.
2. The test duration is 3 hours.
3. Questions may vary from student to student.
4. The test will contribute 40% towards your final grade.

Assessment Due Date

Week 12 Friday (2 June 2023) 10:00 am AEST

Return Date to Students

After the certification of grades.

Weighting

40%

Minimum mark or grade

50%

Assessment Criteria

Answers will be automatically marked correct or incorrect.

Referencing Style

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

Submission

Online

Learning Outcomes Assessed

- Characterise the quality parameters of potable water and wastewater
- Formulate a preliminary design of water and wastewater treatment plants
- Design water distribution and wastewater collection networks

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