



ENEC20005 *Advanced Water Engineering*

Term 2 - 2018

Profile information current as at 05/05/2024 11:42 pm

All details in this unit profile for ENEC20005 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

Advanced Water Engineering will introduce you to different components of the hydrologic cycle that are essential for designing complex water infrastructures. In this unit, you will discuss concepts of probability and uncertainty governing water resources projects. You will estimate design rainfall and losses, and peak flows and volumes for engineering design. You will also be introduced to the design of pipe networks for water supply and collection of wastewater and stormwater. You will also be designing hydraulic structures necessary to control urban stormwater. In completing these tasks, you must use appropriate technical language in written communication and work in teams to solve problems.

Details

Career Level: *Postgraduate*

Unit Level: *Level 9*

Credit Points: *12*

Student Contribution Band: *8*

Fraction of Full-Time Student Load: *0.25*

Pre-requisites or Co-requisites

Anti-requisite: ENEC14017 Water Resources Engineering and ENEC13014 Water and Wastewater Technology units combined

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 - 2018

- Melbourne
- Perth
- 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 12-credit Postgraduate unit at CQUniversity requires an overall time commitment of an average of 25 hours of study per week, making a total of 300 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: 35%

2. **Written Assessment**

Weighting: 35%

3. **Examination**

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](#).

Unit Learning Outcomes

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

1. Formulate, plan, manage and complete projects individually or in teams in an ethical and professional manner considering stakeholder requirements and principals of sustainable development
2. Design urban water distribution networks
3. Design urban wastewater collection networks
4. Assess the hydrology of a catchment and estimate design floods for a given annual exceedance probability
5. Design urban stormwater collection and treatment systems
6. Demonstrate a professional level of communication and leadership.

The Learning Outcomes for this unit are linked with **Engineers Australia's Stage 1 Competency Standard for Professional Engineers.**

Alignment of Learning Outcomes, Assessment and Graduate Attributes

 N/A Level	 Introductory Level	 Intermediate Level	 Graduate Level	 Professional Level	 Advanced Level
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Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes					
	1	2	3	4	5	6
1 - Written Assessment - 35%	•	•	•			•
2 - Written Assessment - 35%	•			•	•	•
3 - Examination - 30%		•	•	•	•	

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6
1 - Knowledge	◦	◦	◦	◦	◦	◦
2 - Communication	◦	◦	◦	◦	◦	◦
3 - Cognitive, technical and creative skills	◦	◦	◦	◦	◦	◦
4 - Research	◦	◦	◦	◦	◦	◦
5 - Self-management	◦	◦	◦	◦	◦	◦
6 - Ethical and Professional Responsibility	◦	◦	◦	◦	◦	◦
7 - Leadership	◦					◦
8 - 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
1 - Written Assessment - 35%	◦	◦	◦	◦	◦	◦		
2 - Written Assessment - 35%	◦	◦	◦	◦	◦	◦	◦	
3 - Examination - 30%	◦	◦	◦		◦	◦		

Textbooks and Resources

Textbooks

ENEC20005

Prescribed

Water-Resources Engineering

Edition: Third (2013)

Authors: David A. Chin

Pearson

Harlow , England

Binding: Paperback

[View textbooks at the CQUniversity Bookshop](#)

IT Resources

You will need access to the following IT resources:

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

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 - 09 Jul 2018

Module/Topic	Chapter	Events and Submissions/Topic
Fundamental of Flow in Closed Conduits	Chin: Chapter 2	

Week 2 - 16 Jul 2018

Module/Topic	Chapter	Events and Submissions/Topic
Design of Water Distribution Systems I	Chin: Chapter 3	

Week 3 - 23 Jul 2018

Module/Topic	Chapter	Events and Submissions/Topic
Design of Water Distribution Systems II	Chin: Chapter 3	

Week 4 - 30 Jul 2018

Module/Topic	Chapter	Events and Submissions/Topic
Fundamentals of Flow in Open Channels	Chin: Chapter 4	

Week 5 - 06 Aug 2018

Module/Topic	Chapter	Events and Submissions/Topic
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Design of Sanitary Sewers Chin: Chapter 6

Vacation Week - 13 Aug 2018

Module/Topic	Chapter	Events and Submissions/Topic
		Written Assessment I: Design of Water Supply and Wastewater Collection Systems Due: Vacation Week Thursday (16 Aug 2018) 5:00 pm AEST

Week 6 - 20 Aug 2018

Module/Topic	Chapter	Events and Submissions/Topic
Probability and Statistics in Water-Resources Engineering	Chin: Chapter 8	

Week 7 - 27 Aug 2018

Module/Topic	Chapter	Events and Submissions/Topic
Rainfall Intensity-Frequency and Duration Analysis	Chin: Chapter 9	

Week 8 - 03 Sep 2018

Module/Topic	Chapter	Events and Submissions/Topic
Design of Stormwater Collection Systems I	Chin: Chapter 10	

Week 9 - 10 Sep 2018

Module/Topic	Chapter	Events and Submissions/Topic
Design of Stormwater Collection Systems II	Chin: Chapter 10	

Week 10 - 17 Sep 2018

Module/Topic	Chapter	Events and Submissions/Topic
Design of Stormwater Collection Systems III	Chin: Chapter 10	

Week 11 - 24 Sep 2018

Module/Topic	Chapter	Events and Submissions/Topic
Design of Stormwater Management System	Chin: Chapter 12	Written Assessment II: Design of a stormwater drainage network Due: Week 11 Thursday (27 Sept 2018) 5:00 pm AEST

Week 12 - 01 Oct 2018

Module/Topic	Chapter	Events and Submissions/Topic
Revision		

Review/Exam Week - 08 Oct 2018

Module/Topic	Chapter	Events and Submissions/Topic
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Exam Week - 15 Oct 2018

Module/Topic	Chapter	Events and Submissions/Topic
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Assessment Tasks

1 Written Assessment I: Design of Water Supply and Wastewater Collection Systems

Assessment Type

Written Assessment

Task Description

You are required to design a water-distribution system and wastewater collection system for a given area. Some information related to the project area such as topography and population is provided but you need to collect other relevant information from suppliers, councils and market survey as appropriate. Additional information on the assignment is available on the course website.

This is an individual work which includes open-ended small design projects and some numerical problems.

Assessment Due Date

Vacation Week Thursday (16 Aug 2018) 5:00 pm AEST

Return Date to Students

Week 7 Thursday (30 Aug 2018)

Weighting

35%

Assessment Criteria

Assessment of the design report will be done based on

1. Valid and Verified assumptions: All values and statements should be properly referenced and supported. [Max 20%;]
2. Explanation of the work: All design steps should be explained in full detail. This covers the presentation of appropriate diagrams, statement of the principles and formulas in the correct order, presentation of all necessary steps in the analysis in the correct order and clear presentation of workings with links to the desired results. [Max 60%]
3. Accuracy in calculations and correct results [Max 20%]
4. Appropriate and Professional level of Communication [Pass/Fail - All the design steps should be explained in full detail. You should get Pass from this criteria to get marks from the others.]

Referencing Style

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

Submission

Online

Learning Outcomes Assessed

- Formulate, plan, manage and complete projects individually or in teams in an ethical and professional manner considering stakeholder requirements and principals of sustainable development
- Design urban water distribution networks
- Design urban wastewater collection networks
- Demonstrate a professional level of communication and leadership.

Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills
- Research
- Self-management
- Ethical and Professional Responsibility

2 Written Assessment II: Design of a stormwater drainage network

Assessment Type

Written Assessment

Task Description

Your team has been commissioned to design a stormwater drainage network for a new sub-division. You will use XPSWMM software for the design. You will also do some manual calculations to design stormwater systems. Some of the input data relevant to the chosen location of the project will be sourced from ARR2016 and QUDM. You may need to collect other relevant information from suppliers, councils and market survey as appropriate. Additional information on the assignment is available on the course website.

This team-based project is by design open-ended, and you are to make several assumptions.

Assessment Due Date

Week 11 Thursday (27 Sept 2018) 5:00 pm AEST

Return Date to Students

Review/Exam Week Monday (8 Oct 2018)

Weighting

35%

Assessment Criteria

Assessment of the design report will be done based on:

1. Valid and Verified assumptions: All values and statements should be properly referenced and supported. [Max 20%;]
2. Explanation of the work: All design steps should be explained in full detail. This covers the presentation of appropriate diagrams, statement of the principles and formulas in the correct order, presentation of all necessary steps in the analysis in the correct order and clear presentation of workings with links to the desired results. [Max 60%]
3. Accuracy in calculations and correct results [Max 20%]
4. Appropriate and Professional level of Communication [Pass/Fail - All the design steps should be explained in full detail. You should get Pass from this criteria to get marks from the others.]

Referencing Style

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

Submission

Online Group

Learning Outcomes Assessed

- Formulate, plan, manage and complete projects individually or in teams in an ethical and professional manner considering stakeholder requirements and principals of sustainable development
- Assess the hydrology of a catchment and estimate design floods for a given annual exceedance probability
- Design urban stormwater collection and treatment systems
- Demonstrate a professional level of communication and leadership.

Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills
- Research
- Self-management
- Ethical and Professional Responsibility
- Leadership

Examination**Outline**

Complete an invigilated examination.

Date

During the examination period at a CQUniversity examination centre.

Weighting

30%

Length

120 minutes

Minimum mark or grade

50%

Exam Conditions

Open Book.

Materials

Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments).

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