



# ENEC20005 *Advanced Water Engineering*

## Term 2 - 2020

Profile information current as at 05/05/2024 11:00 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

There are no requisites for this unit.

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 - 2020

- Melbourne
- Online
- 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. **Portfolio**

Weighting: 35%

#### 2. **Portfolio**

Weighting: 35%

#### 3. **Take Home Exam**

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](#).

## 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 and informal discussion with the students.

##### Feedback

Textbook issues

##### Recommendation

Some of the students were unable to purchase the prescribed textbook which negatively affects their learning. There will be no prescribed textbook. Other equivalent resources will be identified and used.

#### Feedback from Self Reflection

##### Feedback

Contextualisation

##### Recommendation

Field visit and/or the guest lecture will be added to provide better contextualisation of the study. Field visit will depend on the COVID situation.

## 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



### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes					
	1	2	3	4	5	6
1 - Portfolio - 35%	•	•	•			•
2 - Portfolio - 35%	•			•	•	•
3 - Take Home Exam - 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 - Portfolio - 35%	○	○	○	○	○	○		
2 - Portfolio - 35%	○	○	○	○	○	○	○	
3 - Take Home Exam - 30%	○	○	○		○	○		

## Textbooks and Resources

### Textbooks

ENEC20005

#### Prescribed

#### Water Resources Engineering

Edition: THIRD

Authors: David A. Chin

Pearson

Binding: eBook

#### Additional Textbook Information

If you prefer to study with a paper copy, they are available at the CQUni Bookshop here: <http://bookshop.cqu.edu.au> (search on the Unit code). eBooks are available at the publisher's website.

[View textbooks at the CQUniversity Bookshop](#)

### IT Resources

**You will need access to the following IT resources:**

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

## 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](mailto:r.sharma@cqu.edu.au)

## Schedule

### Week 1 - 13 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
Fundamentals of flow in closed conduits	Chapter 2	

### Week 2 - 20 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
Design of water distribution system I	Chapter 3	Portfolio 1 Quiz 1

### Week 3 - 27 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
Design of water distribution system II	Chapter 3	Portfolio 1 Quiz 2

### Week 4 - 03 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
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Design of wastewater collection system I

Chapter 6

Portfolio 1 Quiz 3

#### Week 5 - 10 Aug 2020

Module/Topic

Chapter

Events and Submissions/Topic

Design of wastewater collection system II

Chapter 6

Portfolio 1 Quiz 4

**Portfolio I** Due: Week 5 Friday (14 Aug 2020) 11:45 pm AEST

#### Vacation Week - 17 Aug 2020

Module/Topic

Chapter

Events and Submissions/Topic

#### Week 6 - 24 Aug 2020

Module/Topic

Chapter

Events and Submissions/Topic

Probability and statistics in water resources engineering

Chapter 8

#### Week 7 - 31 Aug 2020

Module/Topic

Chapter

Events and Submissions/Topic

Fundamentals of surface water hydrology I

Chapter 9

Portfolio 2 Quiz 1

#### Week 8 - 07 Sep 2020

Module/Topic

Chapter

Events and Submissions/Topic

Fundamentals of surface water hydrology II

Chapter 10

Portfolio 2 Quiz 2

#### Week 9 - 14 Sep 2020

Module/Topic

Chapter

Events and Submissions/Topic

Design of storm water collection system I

Chapter 11

Portfolio 2 Quiz 3

#### Week 10 - 21 Sep 2020

Module/Topic

Chapter

Events and Submissions/Topic

Design of storm water collection system II

Chapter 11

Portfolio 2 Quiz 4

#### Week 11 - 28 Sep 2020

Module/Topic

Chapter

Events and Submissions/Topic

Introduction to storm water management system

Chapter 12

#### Week 12 - 05 Oct 2020

Module/Topic

Chapter

Events and Submissions/Topic

Revision Week

**Portfolio II** Due: Week 12 Monday (5 Oct 2020) 11:45 pm AEST

**Take-Home Exam** Due: Week 12 Friday (9 Oct 2020) 9:00 am AEST

#### Review/Exam Week - 12 Oct 2020

Module/Topic

Chapter

Events and Submissions/Topic

#### Exam Week - 19 Oct 2020

Module/Topic

Chapter

Events and Submissions/Topic

## Assessment Tasks

# 1 Portfolio I

## Assessment Type

Portfolio

## Task Description

Portfolio 1 (35% of unit total marks) has two components:

- Online tests (15 marks)
- Assignment (20 marks)

The omission of any of the above-mentioned items from Portfolio 1 will automatically result in a Fail grade. The aim of Portfolio 1 is to allow students to demonstrate their understanding of the various concepts, theories and processes presented during the weeks 1-5.

This assessment task is designed to allow students to demonstrate their understanding of the topics covered during the week. The main characteristics of the weekly tests are:

### Online tests:

- s of the weekly tests are:
- There are four weekly tests. You should attempt at least three tests and the fourth test is extra.
- Each test carries five marks;
- Total marks from the three highest scored tests will be your final score with a maximum score of 15;
- You are allowed to attempt each test only once;
- There will be four or five numerical/multi-choice questions in each test;
- Duration of the tests will be around 15 minutes;
- Feedback is immediate as to whether the correct or wrong answer has been entered but no detailed information will be given on the processes.

## Assignment

This assessment task is designed to allow students to demonstrate their understanding of the topics covered during the first five weeks. You will work to design and analyse water-distribution and wastewater collection systems. Some information related to the project area is provided and you need to collect other relevant information from suppliers, councils and market survey as appropriate. This project is by design open-ended, and you are to make several assumptions. Additional information on the project and assessment criteria is available on the unit website.

## Assessment Due Date

Week 5 Friday (14 Aug 2020) 11:45 pm AEST

## Return Date to Students

Within two weeks after submission.

## Weighting

35%

## Minimum mark or grade

50%

## Assessment Criteria

Assignment will be assessed based on

1. Valid and Verified assumptions: All values and statements should be properly referenced and supported.
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.
3. Accuracy in calculations and correct results.
4. Appropriate and professional level of Communication: The report should show step by step process of the design and should be reported in a professional way.

## 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 Portfolio II**

### **Assessment Type**

Portfolio

### **Task Description**

Portfolio 2 (35% of unit total marks) has three components:

- Online tests (15 marks)
- Assignment (20 marks)

The omission of any of the above-mentioned items from Portfolio 2 will automatically result in a Fail grade. The aim of Portfolio 2 is to allow students to demonstrate their understanding of the various concepts, theories and processes presented during the weeks 6-10.

#### **Online tests:**

This assessment task is designed to allow students to demonstrate their understanding of the topics covered during the week. The main characteristics of the weekly tests are:

- There are four weekly tests. You should attempt at least three tests and the fourth test is extra.
- Each test carries five marks;
- Total marks from the three highest scored tests will be your final score with a maximum score of 15;
- You are allowed to attempt each test only once;
- There will be four or five numerical/multi-choice questions in each test;
- Duration of the tests will be around 15 minutes;
- Feedback is immediate as to whether the correct or wrong answer has been entered but no detailed information will be given on the processes.

### **Assignment**

This assessment task is designed to allow students to demonstrate their understanding of the topics covered during weeks 6-10. You will work to design a stormwater drainage system for a sub-division using industry-standard software. Some of the input data relevant to the chosen location of the project will be sourced from ARR2016, QUDM and other sources. This project is by design open-ended, and you are to make several assumptions. Your individual marks from the report depend on your contribution to the project. Details of the project will be provided on the unit website.

### **Assessment Due Date**

Week 12 Monday (5 Oct 2020) 11:45 pm AEST

### **Return Date to Students**

Within two weeks of submission.

### **Weighting**

35%

### **Minimum mark or grade**

50%

### **Assessment Criteria**

Assignment will be assessed based on

1. Valid and Verified assumptions: All values and statements should be properly referenced and supported.
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.
3. Accuracy in calculations and correct results.



4. Appropriate and professional level of Communication. The report should show step by step process of the design and should be reported in a professional way.

### 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
- 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

## 3 Take-Home Exam

### Assessment Type

Take Home Exam

### Task Description

Take-Home Exam is an open book to do at home, and it is of two hours duration. Further information on the exam schedule will be available on the unit Moodle website in week 10. The exam paper will have four numerical questions. The questions will be posted online 15 mins before the start time. Students must scan their answer scripts and upload on the unit Moodle website within 10 mins after the exam has finished.

### Assessment Due Date

Week 12 Friday (9 Oct 2020) 9:00 am AEST

### Return Date to Students

Afterb the certification of grades.

### Weighting

30%

### Assessment Criteria

No Assessment Criteria

### Referencing Style

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

### Submission

No submission method provided.

### Learning Outcomes Assessed

- Design urban water distribution networks
- Design urban wastewater collection networks
- Assess the hydrology of a catchment and estimate design floods for a given annual exceedance probability
- Design urban stormwater collection and treatment systems

### Graduate Attributes

- Knowledge
- Communication

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

## 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