



# ENEC14017 Water Resources Engineering

## Term 2 - 2021

Profile information current as at 20/04/2024 06:18 pm

All details in this unit profile for ENEC14017 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 the application of the principles of hydraulics and hydrology to solve water engineering problems. You will study the probability, risk and uncertainty concepts governing hydrologic and hydrology design. You are also introduced to groundwater resources, river and reservoir routing, rapid and gradually varying flow in open channels, flood and stormwater control, design of hydraulic structures, and sedimentation and erosion hydraulics. The unit requires you to solve design problems in catchment hydrology and urban flood water management and prepare basic designs. In completing these tasks, you must use appropriate technical language in written communication and work in teams to solve problems.

### Details

Career Level: *Undergraduate*

Unit Level: *Level 4*

Credit Points: *12*

Student Contribution Band: *8*

Fraction of Full-Time Student Load: *0.25*

### Pre-requisites or Co-requisites

Prerequisite: ENEC12010 Hydraulics & 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 2 - 2021

- 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 12-credit Undergraduate 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: 50%

#### 2. **Portfolio**

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](#).

## 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 Survey

**Feedback**

The practice quizzes were a great help and should be kept in the future.

**Recommendation**

The practice quizzes will be available in the future terms.

#### Feedback from Moodle Survey

**Feedback**

Some of the quiz questions were unexpected or too open ended.

**Recommendation**

Expectations will be communicated more frequently that some of the questions will be open-ended.

#### Feedback from Moodle Survey

**Feedback**

The delivery should be more engaging.

**Recommendation**

Lectures will be recorded so the workshops will be more engaging with more activities, discussions or case studies.

## Unit Learning Outcomes

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

1. Apply skills in hydraulics and hydrology to water engineering design
2. Conduct a hydrology assessment of a catchment
3. Design urban stormwater management systems
4. Prepare team reports for water engineering projects.

**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 1.4 Discernment of knowledge development and research directions within the engineering discipline. (LO: 1N 2N 3N )**

**Intermediate 2.3 Application of systematic engineering synthesis and design processes. (LO: 1I 2I 3I ) 2.4 Application of systematic approaches to the conduct and management of engineering projects. (LO: 1I 2I 3I ) 3.3 Creative, innovative and proactive demeanour. (LO: 4I )**

**Advanced 1.1 Comprehensive, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline. (LO: 1A 2A 3I ) 1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline. (LO: 1A 2A 3I ) 1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline. (LO: 1A 2A 3I ) 1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline. (LO: 1A 2A 3I ) 1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline. (LO: 1A 2A 3I ) 2.1 Application of established engineering methods to complex engineering problem-solving. (LO: 1A 2A 3I ) 2.2 Fluent application of engineering techniques, tools and resources. (LO: 1A 2A 3I ) 3.2 Effective oral and written communication in professional and lay domains. (LO: 4A ) 3.4 Professional use and management of information. (LO: 4A ) 3.6 Effective team membership and team leadership. (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 - Portfolio - 50%	•	•		•
2 - Portfolio - 50%	•		•	•

### 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				

### Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
1 - Portfolio - 50%	•	•	•	•		•				
2 - Portfolio - 50%	•	•	•	•	•	•				

## Textbooks and Resources

### Textbooks

ENEC14017

#### Prescribed

#### Water-Resources Engineering

Third Edition (2013)

Authors: David A. Chin

Pearson Education Limited

Harlow , Essex CM202 2JE , UK

ISBN: ISBN-13: 978-0-273-78591-0

Binding: Paperback

#### Additional Textbook Information

Both paper and eBook versions can be purchased at the CQUni Bookshop here: <http://bookshop.cqu.edu.au> (search on the Unit code).

[View textbooks at the CQUniversity Bookshop](#)

### IT Resources

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

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- QGIS Software
- TUFLOW Software

## 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 - 12 Jul 2021

Module/Topic	Chapter	Events and Submissions/Topic
Probability, Risk and Uncertainty Analysis for Hydrologic and Hydraulic Design	Chin: Chapter 8	

### Week 2 - 19 Jul 2021

Module/Topic	Chapter	Events and Submissions/Topic
Rainfall Intensity-Frequency-Duration		

### Week 3 - 26 Jul 2021

Module/Topic	Chapter	Events and Submissions/Topic
Design Rainfall Temporal Patterns and Losses		

<b>Week 4 - 02 Aug 2021</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Urban drainage: Inlet, Pits and Gutters		
<b>Week 5 - 09 Aug 2021</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Urban drainage: Stormwater Pipes		
<b>Vacation Week - 16 Aug 2021</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
<b>Week 6 - 23 Aug 2021</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Urban drainage: Culverts		<b>Portfolio 1</b> Due: Week 6 Monday (23 Aug 2021) 11:45 pm AEST
<b>Week 7 - 30 Aug 2021</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Urban drainage: Modeling		
<b>Week 8 - 06 Sep 2021</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Urban Water Quality		
<b>Week 9 - 13 Sep 2021</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Water Sensitive Urban Design I		
<b>Week 10 - 20 Sep 2021</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Water Sensitive Urban Design II		
<b>Week 11 - 27 Sep 2021</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Impact of Climate Change in Water Resources		
<b>Week 12 - 04 Oct 2021</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
Project Report		<b>Portfolio 2</b> Due: Week 12 Friday (8 Oct 2021) 11:45 pm AEST
<b>Review/Exam Week - 11 Oct 2021</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>
<b>Exam Week - 18 Oct 2021</b>		
<b>Module/Topic</b>	<b>Chapter</b>	<b>Events and Submissions/Topic</b>

## Assessment Tasks

### 1 Portfolio 1

#### Assessment Type

Portfolio

#### Task Description

**Portfolio 1** (50% of total unit marks) has two components:

- Project Report 1 (30%)
- Online Test 1 (20%)

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 Weeks 1-5. Further details of various aspects are provided on the unit's Moodle website.

### **Project Report 1**

This assessment task is designed to allow students to demonstrate their understanding of the topics covered during the first five weeks and covers Los 1 and 2. The questions require demonstration of adequate presentation of water resources engineering problems, and the topics may include:

- Probability, Risk and Uncertainty Analysis for Hydrologic and Hydraulic Design
- Rainfall Intensity-Frequency-Duration
- Design Rainfall Temporal Patterns and Losses
- Urban drainage

### **Online Test 1**

This assessment task consists of one online Test (Quizzes) covering topics of Weeks 1-5. The main characteristics of the online Test are:

- You are allowed to attempt the test only two times within a given time frame as specified in the unit Schedule on Moodle website, the due date of the online Test is different from the rest of the Portfolio Items;
- There will be between 10 and 20 numerical questions;
- You have 90-180 minutes from when you start your attempt to submit your answers;
- On each attempt, all questions must be answered;
- The average score of the two attempts will be used, and if only one attempt that score will be used;
- Feedback is immediate as to whether the correct or wrong answer has been entered but no detailed information is given on the processes.
- The test opens on Monday of the submission week.

### **Assessment Due Date**

Week 6 Monday (23 Aug 2021) 11:45 pm AEST

### **Return Date to Students**

Two weeks after submission

### **Weighting**

50%

### **Minimum mark or grade**

50%

### **Assessment Criteria**

Assessment of the portfolio will be based on the assessment outcomes of the 2 different portfolio items. The project report will be assessed using the following key criteria.

- problem formulation which covers clarity of the data given, clarity of the desired result, and assumptions stated;
- solution process which 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, clear presentation of
- workings with links to the desired results, and use of correct units;
- accuracy and correct results.

Online test will be marked based on whether the correct or wrong answer has been entered but no detailed information is given on the processes.

### **Referencing Style**

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

### **Submission**

No submission method provided.

### **Learning Outcomes Assessed**

- Apply skills in hydraulics and hydrology to water engineering design
- Conduct a hydrology assessment of a catchment

- Prepare team reports for water engineering projects.

### **Graduate Attributes**

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence

## **2 Portfolio 2**

### **Assessment Type**

Portfolio

### **Task Description**

**Portfolio 2** (50% of total unit marks) has two components:

- Project Report 2 (30%)
- Online Test 2 (20%)

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 in this unit.

### **Project Report 2**

Assessment 2 covers LOs 1, 2, 3 and 4. You will use TUFLOW software for the design. Some of the input data relevant to the chosen location of the project will be sourced from ARR2016 and QUDM. Details of the Team Project will be provided on the unit website.

### **Online Test 2**

This assessment task consists of one online Test (Quizzes) covering topics of Weeks 6-11. The main characteristics of the online Test are:

- You are allowed to attempt the test only two times within a given time frame as specified in the unit Schedule on Moodle website, the due date of the online test is different from that of the rest of the Portfolio Items;
- There will be between 10 and 20 numerical questions;
- You have 90-180 minutes from when you start your attempt to submit your answers.
- On each attempt, all questions must be answered;
- The average score of the two attempts will be used, and if only one attempt that score will be used;
- Feedback is immediate as to whether the correct or wrong answer has been entered but no detailed information is given on the processes.
- The test opens on Monday of the submission week.

### **Assessment Due Date**

Week 12 Friday (8 Oct 2021) 11:45 pm AEST

### **Return Date to Students**

The assessment will be returned after the certification of grades.

### **Weighting**

50%

### **Minimum mark or grade**

50%

### **Assessment Criteria**

Assessment of the portfolio will be based on the assessment outcomes of the 2 different portfolio items. The project report will be assessed using the following key criteria.

- problem formulation which covers clarity of the data given, clarity of the desired result, and assumptions stated;
- solution process which 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, clear presentation of
- workings with links to the desired results, and use of correct units;
- accuracy and correct results.

Online test will be marked based on whether the correct or wrong answer has been entered but no detailed information is given on the processes.

**Referencing Style**

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

**Submission**

No submission method provided.

**Learning Outcomes Assessed**

- Apply skills in hydraulics and hydrology to water engineering design
- Design urban stormwater management systems
- Prepare team reports for water engineering projects.

**Graduate Attributes**

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Team Work
- Information Technology Competence

## 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