



# **ENEC20004 *Advanced Transportation***

## **Engineering Design**

### **Term 1 - 2020**

Profile information current as at 01/07/2022 02:41 pm

All details in this unit profile for ENEC20004 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.

## Corrections

### Unit Profile Correction added on 30-04-20

The end of term examination was cancelled due to Covid-19 pandemic restrictions. An alternative assessment item has been arranged for the final examination and details are available on the unit's Moodle page. **The learning outcomes assessed are unchanged.**

## General Information

### Overview

Advanced Transportation Engineering Design will prepare you to analyse and solve complex transportation problems. You will develop strategies for managing and controlling traffic, identifying safety issues and recommending solutions. You will also analyse and design intersections using the appropriate software. In this unit, you will apply design codes to solve common design problems involving intersection design and pavement design in an ethical and professional manner by considering stakeholders and sustainability requirements. You are required to work, learn and communicate effectively in a professional manner, independently and in project teams. If you are enrolled in distance mode, you will be required to attend a compulsory residential school during the term.

### 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: ENEC14016 Traffic and Transportation 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 1 - 2020

- Melbourne
- Mixed Mode
- 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).

### Residential Schools

This unit has a Compulsory Residential School for distance mode students and the details are:

Click here to see your [Residential School Timetable](#).

### 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: 30%

2. **Portfolio**

Weighting: 30%

3. **Practical Assessment**

Weighting: 10%

4. **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](#).

## 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 Student Unit Evaluation

##### Feedback

The tutorial and workshop activities were acknowledged to aid learning. This involve hands-on demonstrations on worked examples and suitable exercise on the Industry based software.

##### Recommendation

The tutorial and workshop sessions will continue to be implemented. The hands-on demonstrations of worked examples will be continued.

#### Feedback from Student Unit Evaluation

##### Feedback

The Moodle site format with Icon to aid navigation was reported as the best aspect of the unit. It was graded 4.8 out of 5.

##### Recommendation

The format of the Moodle site with Icon aiding navigation will be implemented across all units delivered by the lecturer.

#### Feedback from Student Unit Evaluation

##### Feedback

The printed formulas sheet provided in the examination was not very legible in some instances.

##### Recommendation

Work with the examination office to preview the required formula sheet. This is to ensure legibility after printing on coloured paper.

## Unit Learning Outcomes

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

1. Analyse traffic flows and describe the effects of key traffic flow parameters and their inter-relationships
2. Apply systematic approaches to conduct capacity analysis and level of service of roadways and intersections
3. Evaluate the pavement sublayer materials properties using appropriate Australian guidelines
4. Design structural road pavements using appropriate Australian guidelines
5. Formulate, plan, manage and complete projects individually or in teams in an ethical and professional manner considering stakeholder requirements and principals of sustainable development
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

Assessment Tasks	Learning Outcomes					
	1	2	3	4	5	6
1 - Portfolio - 30%	•	•			•	•
2 - Portfolio - 30%			•	•	•	•
3 - Practical Assessment - 10%			•			
4 - 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 - Portfolio - 30%	○	○	○	○	○	○	○	
2 - Portfolio - 30%	○	○	○	○	○	○	○	
3 - Practical Assessment - 10%	○	○	○	○	○	○	○	
4 - Examination - 30%	○	○	○		○	○		

## Textbooks and Resources

### Textbooks

ENEC20004

#### Supplementary

#### Traffic Engineering

5th Edition (2018)

Authors: Roger P. Roess, Elena S. Prassas, Elena S. Prassas

Pearson

ISBN: 9780134599717

Binding: Hardcover

### 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

**Kali Nepal** Unit Coordinator

[k.nepal@cqu.edu.au](mailto:k.nepal@cqu.edu.au)

## Schedule

### WEEK 1: TRAFFIC FLOW FUNDAMENTALS AND RELATIONSHIPS - 09 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
TRAFFIC FLOW FUNDAMENTALS AND RELATIONSHIPS	A Guide to Traffic Management Part 2: Traffic Theory (AGTM02)	

### WEEK 2: TRAFFIC FLOW ANALYSIS (1) : CAPACITY AND LEVEL OF SERVICE CONCEPTS - 16 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
CAPACITY AND LEVEL OF SERVICE CONCEPTS	Highway Capacity Manual (2016) Chapters 4, 5 & 10	

### WEEK 3: TRAFFIC FLOW ANALYSIS (2): FREEWAYS AND MULTILANE ROADS - 23 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
FREEWAYS AND MULTILANE ROADS	Highway Capacity Manual (2016) (Chapters 12-14)	

### WEEK 4: TRAFFIC FLOW ANALYSIS (3): TWO-LANE TWO-WAY ROADS - 30 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
TWO-LANE TWO-WAY ROADS	Highway Capacity Manual (2016) (Chapter 15)	Traffic Engineering Portfolio: Quiz#1

### WEEK 5: ANALYSIS AND DESIGN OF ROAD INTERSECTIONS (1): UNSIGNALISED INTERSECTIONS - 06 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
UNSIGNALISED INTERSECTIONS	Highway Capacity Manual (2016) (Chapter 20)	

#### Vacation Week - 13 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
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#### WEEK 6: ANALYSIS AND DESIGN OF ROAD INTERSECTIONS (2): ROUNDABOUTS AND TRAFFIC SIGNALS - 20 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
ROUNDABOUTS AND TRAFFIC SIGNALS	Highway Capacity Manual (2016) (Chapters 22-23)	Traffic Engineering Portfolio: Quiz#2

#### WEEK 7: PAVEMENT DESIGN SYSTEM AND PAVEMENT DESIGN INPUT PARAMETERS (1) - 27 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
PAVEMENT DESIGN INPUT PARAMETERS (1)	A Guide to Pavement Technology: Part 2 (AGPT02)	<b>Traffic Engineering Portfolio</b> Due: Week 7 Friday (1 May 2020) 5:00 pm AEST

#### WEEK 8: PAVEMENT DESIGN INPUT PARAMETERS (2): PAVEMENT MATERIALS - 04 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
PAVEMENT MATERIALS	A Guide to Pavement Technology: Part 2 (AGPT02)	

#### WEEK 9: PAVEMENT DESIGN (1): FLEXIBLE PAVEMENTS - 11 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
FLEXIBLE PAVEMENTS	A Guide to Pavement Technology: Part 2 (AGPT02)	

#### WEEK 10: PAVEMENT DESIGN (2): RIGID PAVEMENTS - 18 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
RIGID PAVEMENTS	A Guide to Pavement Technology: Part 2 (AGPT02)	

#### WEEK 11: PAVEMENT DESIGN (3): PAVEMENT OVERLAY - 25 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
PAVEMENT OVERLAY	A Guide to Pavement Technology: Part 2 (AGPT02)	Pavement Design Portfolio: Quiz

#### Week 12: Revision - 01 Jun 2020

Module/Topic	Chapter	Events and Submissions/Topic
		<b>Pavement Design Portfolio</b> Due: Week 12 Friday (5 June 2020) 5:00 pm AEST <b>Practical Assessment Report</b> Due: Week 12 Friday (5 June 2020) 5:00 pm AEST

#### Review/Exam Week - 08 Jun 2020

Module/Topic	Chapter	Events and Submissions/Topic
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#### Exam Week - 15 Jun 2020

Module/Topic	Chapter	Events and Submissions/Topic
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## Assessment Tasks

# 1 Traffic Engineering Portfolio

## Assessment Type

Portfolio

## Task Description

This assessment item relates to the unit learning outcomes 1, 2, 5 and 6. It contains two quizzes and tasks and covers Week 1 to Week 6 learning resources. Details of the tasks will be provided in Moodle.

## Assessment Due Date

Week 7 Friday (1 May 2020) 5:00 pm AEST

## Return Date to Students

Week 9 Friday (15 May 2020)

## Weighting

30%

## Minimum mark or grade

50%

## Assessment Criteria

(100%) Content, presentation and layout includes:

- the accuracy and relevance of information
- application of knowledge
- language and grammar used in answering questions
- proper referencing of sources of information (when referencing, Harvard style should be used.)
- equations, images, data and tables, and the quality of presentation and layout.

## Referencing Style

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

## Submission

Online

## Learning Outcomes Assessed

- Analyse traffic flows and describe the effects of key traffic flow parameters and their inter-relationships
- Apply systematic approaches to conduct capacity analysis and level of service of roadways and intersections
- Formulate, plan, manage and complete projects individually or in teams in an ethical and professional manner considering stakeholder requirements and principals of sustainable development
- 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

# 2 Pavement Design Portfolio

## Assessment Type

Portfolio

## Task Description

This assessment item relates to the unit learning outcomes 3, 4, 5 and 6. It contains a quiz and tasks and covers Week 7 to Week 11 learning resources. Details of the tasks will be provided in Moodle.

## Assessment Due Date

Week 12 Friday (5 June 2020) 5:00 pm AEST

## Return Date to Students

Review/Exam Week Friday (12 June 2020)

## Weighting

30%

**Minimum mark or grade**

50%

**Assessment Criteria**

(100%) Content, presentation and layout includes:

- the accuracy and relevance of information
- application of knowledge
- language and grammar used in answering questions
- proper referencing of sources of information (when referencing, Harvard style should be used.)
- equations, images, data and tables, and the quality of presentation and layout.

**Referencing Style**

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

**Submission**

Online

**Learning Outcomes Assessed**

- Evaluate the pavement sublayer materials properties using appropriate Australian guidelines
- Design structural road pavements using appropriate Australian guidelines
- Formulate, plan, manage and complete projects individually or in teams in an ethical and professional manner considering stakeholder requirements and principals of sustainable development
- 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 Practical Assessment Report

**Assessment Type**

Practical Assessment

**Task Description**

This assessment item relates to the unit learning outcomes 3, 4, 5 and 6. It relates to writing a professional laboratory report on all practical activities completed during the trimester. Details of the tasks will be provided in Moodle.

**Assessment Due Date**

Week 12 Friday (5 June 2020) 5:00 pm AEST

**Return Date to Students**

Review/Exam Week Friday (12 June 2020)

**Weighting**

10%

**Minimum mark or grade**

50%

**Assessment Criteria**

(100%) Content, presentation and layout includes:

- the accuracy and relevance of information
- application of knowledge
- language and grammar used in answering questions
- proper referencing of sources of information (when referencing, Harvard style should be used.)
- equations, images, data and tables, and the quality of presentation and layout.

**Referencing Style**

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

**Submission**

Online Group

**Submission Instructions**

Submit one copy per group (uploaded by a member of the group)

**Learning Outcomes Assessed**

- Evaluate the pavement sublayer materials properties using appropriate Australian guidelines

**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**

180 minutes

**Minimum mark or grade**

50%

**Exam Conditions**

Closed Book.

**Materials**

Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments).  
Calculator - all non-communicable calculators, including scientific, programmable and graphics calculators are authorised

## 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