



ENEC12011 *Transport Systems*

Term 2 - 2020

Profile information current as at 28/11/2021 06:46 pm

All details in this unit profile for ENEC12011 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

This unit introduces the design of roads and associated documentation. You are introduced to traffic analysis, safety, efficiency, environmental and cultural issues and sustainability of road design. You will analyse traffic survey data and interpret survey results, applying them to analysis of traffic flows and estimation of system capacity. You also apply design codes and manuals to common design problems involving geometric design of roads, road drainage, intersection design and pavement design and rehabilitation. You also collaborate with your team members to prepare plans, compile specifications and estimate quantities and costs.

Details

Career Level: *Undergraduate*

Unit Level: *Level 2*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

Prerequisites: [ENEC12009 Engineering Surveying OR ENAR12005 Surveying and Mapping] AND [MATH11218 Applied Mathematics OR MATH11160 Technology Mathematics]

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

- 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: 40%

3. **Written Assessment**

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 Moodle Website & Email

Feedback

Very organised and well-planned unit.

Recommendation

Continue to keep the same quality every year.

Feedback from Moodle Website

Feedback

Weekly activity sheets were providing informative content which was helpful in learning.

Recommendation

Continue to add more useful materials to the unit content.

Feedback from Moodle Website

Feedback

Weekly quizzes helped to retain information and acquire knowledge.

Recommendation

Continue to provide online weekly quizzes.

Feedback from Moodle Website

Feedback

The staff had good technical knowledge, the lecturer was quick to answer questions.

Recommendation

Quick and clear response to student inquiries is of high importance in learning development. The same quality of support is recommended in future offerings.

Feedback from Moodle Website

Feedback

Lecture recordings were difficult to hear.

Recommendation

The audio quality of the recorded videos will be checked and the recordings will be edited if needed.

Feedback from Moodle Website

Feedback

Tutorial questions were thoroughly explained and solved during the sessions. However, the tutorial answers should be uploaded on Moodle earlier.

Recommendation

In future offerings, the solutions will be uploaded after the lecture session.

Feedback from Moodle Website

Feedback

Example reports/assignments could help to clarify the requirements of the assignment.

Recommendation

It has been tried to solve questions and examples similar to assignment tasks during the tutorial sessions. However, example reports will be uploaded on Moodle if possible.

Unit Learning Outcomes

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

1. Organise and conduct traffic surveys, analyse collected data and interpret the results
2. Apply standard techniques to forecasting future traffic demand
3. Design and document geometric alignments of transportation infrastructure using appropriate Australian guidelines
4. Evaluate the pavement sublayer materials properties using appropriate Australian guidelines
5. Design a basic road pavements using appropriate Australian guidelines
6. Demonstrate a professional level of communication

The learning outcomes are linked to Engineers Australia Stage 1 Competencies and also discipline capabilities.

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 - Written Assessment - 30%	•	•				•
2 - Written Assessment - 40%		•	•			•
3 - Written Assessment - 30%				•	•	•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6
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						

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes								
	1	2	3	4	5	6	7	8	9
1 - Written Assessment - 30%	•	•	•	•		•	•	•	
2 - Written Assessment - 40%	•	•	•	•		•	•	•	
3 - Written Assessment - 30%	•	•	•	•		•	•	•	

Textbooks and Resources

Textbooks

ENEC12011

Prescribed

MASTERING AUTOCAD CIVIL 3D: AUTODESK OFFICIAL PRESS: 20161ST EDITION (2015)

Authors: Davenport & Voiculescu

John Wiley and Sons

Hoboken , NJ , USA

ISBN 9781119059745

Binding: Paperback

ENEC12011

Prescribed

TRAFFIC AND HIGHWAY ENGINEERINGFifth edition (2019)

Authors: Nicholas J Garber , Lester A Hoel

Cengage Learning

ISBN 9781337631044

Binding: Paperback

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)
- AutoCAD Civil 3D
- Pavement Design Software CIRCLY

Referencing Style

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

For further information, see the Assessment Tasks.

Teaching Contacts

Farzaneh Tahmoorian Unit Coordinator

f.tahmoorian@cqu.edu.au

Schedule

Introduction to Transportation Engineering and Civil 3D (Introduction) - 13 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
Basic Concept of Traffic and Highway Engineering	1. Chapters 1 and 2 in Traffic & Highway Engineering (Garber & Hoel)	
Transportation Systems	2. Chapter 1 in Mastering AutoCAD	
Introduction to AutoCAD Civil 3D	Civil 3D (2016)	

Traffic Engineering Studies and Civil 3D (Understanding the User Interface) - 20 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
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Main Components of Highway Mode
Traffic Studies
Understanding the AutoCAD Civil 3D
User Interface (I)

1. Chapters 3 and 4 in Traffic & Highway Engineering (Garber & Hoel)
2. Chapter 2 in AGTM03-17
3. Chapter 1 in Mastering AutoCAD Civil 3D (2016)

Traffic Surveys and Analysis - 27 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
Traffic Surveys Principles of Traffic Flow Understanding the AutoCAD Civil 3D User Interface (II)	1. Chapters 4 and 6 in Traffic & Highway Engineering (Garber & Hoel) 2. Chapter 2 in AGTM03-17 3. Chapter 1 in Mastering AutoCAD Civil 3D (2016)	

Travel Demand Forecasting - 03 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Basic Elements of Transportation Planning Demand Forecasting Approaches Understanding the AutoCAD Civil 3D User Interface (III)	1. Chapters 12 in Traffic & Highway Engineering (Garber & Hoel) 2. Chapter 1 in Mastering AutoCAD Civil 3D (2016)	

Geometric Design 1: Fundamentals and Design Objectives - 10 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Fundamental Considerations in Road Design Road Network Classification Geometric Design of Highway Facilities Alignments in AutoCAD Civil 3D	1. Chapters 15 in Traffic & Highway Engineering (Garber & Hoel) 2. Chapters 2 and 3 in AGRD03-16 3. Chapter 6 in Mastering AutoCAD Civil 3D (2016)	Traffic Engineering Due: Week 5 Friday (14 Aug 2020) 5:00 pm AEST

Vacation Week - 17 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic

Geometric Design 2: Cross Section and Sight Distances - 24 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Cross Section Sight Distances Alignments in AutoCAD Civil 3D	1. Chapters 15 in Traffic & Highway Engineering (Garber & Hoel) 2. Chapters 4 and 5 in AGRD03-16 3. Chapter 6 in Mastering AutoCAD Civil 3D (2016)	

Geometric Design 3: Horizontal Alignment - 31 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Design of the Horizontal Alignment Alignments in AutoCAD Civil 3D	1. Chapters 15 in Traffic & Highway Engineering (Garber & Hoel) 2. Chapters 7 in AGRD03-16 3. Chapter 6 in Mastering AutoCAD Civil 3D (2016)	

Geometric Design 4: Vertical Alignment - 07 Sep 2020

Module/Topic	Chapter	Events and Submissions/Topic
Design of the Vertical Alignment Profiles in AutoCAD Civil 3D	1. Chapters 15 in Traffic & Highway Engineering (Garber & Hoel) 2. Chapters 8 in AGRD03-16 3. Chapter 7 in Mastering AutoCAD Civil 3D (2016)	

Pavement Materials - 14 Sep 2020

Module/Topic	Chapter	Events and Submissions/Topic

Pavement Types Pavement Materials Profiles in AutoCAD Civil 3D	1. Chapters 2 and 6 in AGPT02-17 2. Chapter 6 in TMR Supplement Guide (2018) 3. Chapter 7 in Mastering AutoCAD Civil 3D (2016)	Geometric Design Due: Week 9 Friday (18 Sept 2020) 5:00 pm AEST
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Pavement Design Traffic - 21 Sep 2020

Module/Topic	Chapter	Events and Submissions/Topic
Pavement Design Traffic Utilities in AutoCAD Civil 3D	1. Chapter 7 in AGPT02-17 2. Chapter 7 in TMR Supplement Guide (2018) 3. Chapter 9 in Mastering AutoCAD Civil 3D (2016)	

Design of Flexible pavements - 28 Sep 2020

Module/Topic	Chapter	Events and Submissions/Topic
Flexible Pavement Design Pavement Design Software CIRCLY	1. Chapter 8 in AGPT02-17 2. Chapter 8 in TMR Supplement Guide (2018)	

Design of Rigid Pavement - 05 Oct 2020

Module/Topic	Chapter	Events and Submissions/Topic
Rigid Pavement Design	1. Chapter 9 in AGPT02-17 2. Chapter 9 in TMR Supplement Guide (2018)	

Review/Exam Week - 12 Oct 2020

Module/Topic	Chapter	Events and Submissions/Topic
		Pavement Design Due: Review/Exam Week Friday (16 Oct 2020) 5:00 pm AEST

Exam Week - 19 Oct 2020

Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 Traffic Engineering

Assessment Type

Written Assessment

Task Description

The aim of this assessment is to allow the students to demonstrate their understanding of various concepts, theories, and processes developed in Traffic Engineering topics covered in this unit.

This assessment (30% of the total unit marks) has two components

- Individual Assignment (15%)
- Online Quiz (15%)

Individual Assignment

- This is an assignment type where students are required to organise and conduct a traffic survey.
- The brief detail requirements will be made available on the unit's Moodle website in week 1.
- The survey fundamentals will cover topics of Weeks 1-3.

Online Test

This assessment task consists of one online Test (Quizzes) covering topics of Weeks 1-3. 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;

- There will be between 10 and 20 Numerical questions;
- Questions will be randomly generated
- You are allowed a maximum of two attempts.
- The score will be the average grade from the number of attempts
- You have 90 minutes from when you start your attempt to submit your answers.
- Feedback is immediate regarding whether your answer is correct or incorrect but no detailed information on the process is given

Assessment Due Date

Week 5 Friday (14 Aug 2020) 5:00 pm AEST

Return Date to Students

Week 6 Friday (28 Aug 2020)

Weighting

30%

Minimum mark or grade

15

Assessment Criteria

Each main steps in task will be assessed separately for the criterion *accuracy and correct results*.

- Correct application of mathematics and arithmetic
- Reference to correct Standards and/or principles
- Answers clearly identified
- Correct results

In addition, the assignment as a whole will be assessed against the following criteria:

Evidence of correct procedures

- All necessary steps in analysis are present in correct order
- Clear presentation of mathematical and arithmetical working linking given details of the problem to the results obtained
- Evidence of checking results (mathematical, graphical, logic-common sense)

Evidence of understanding of the topic

- Explanation of choices made in the analysis (why is procedure required, why this particular procedure)
- Interpretation of results, eg limitations, direction of vectors

Professional presentation

- The work (job) is clearly identified (problem, date, analysis)
- Clear statement of each problem and its details and requirements
- Logical layout of analysis
- Appropriate use of diagrams, clear diagrams
- Correct use of terminology, conventions
- Clear English in the explanation of procedure and interpretation of results.

Referencing Style

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

Submission

Online

Learning Outcomes Assessed

- Organise and conduct traffic surveys, analyse collected data and interpret the results
- Apply standard techniques to forecasting future traffic demand
- Demonstrate a professional level of communication

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence
- Cross Cultural Competence
- Ethical practice

2 Geometric Design

Assessment Type

Written Assessment

Task Description

The aim of this assessment is to allow the students to demonstrate their understanding of various concepts, theories and processes developed in Traffic studies topics covered in this unit.

This assessment (40% of the total unit marks) has two components

- Individual Design task (25%)
- Online Quiz (15%)

Individual Assignment

- This is a design task to allow students to demonstrate their understanding of geometric design principles in accordance with the Australian standard.
- A *Project Brief* detailing the requirements will be made available on the unit's Moodle website in week 3.

Online Test

This assessment task consists of one online Test (Quizzes) covering topics of Weeks 4-8. 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;
- There will be between 10 and 20 Numerical questions;
- Questions will be randomly generated
- You are allowed a maximum of two attempts.
- The score will be the average grade from the number of attempts
- You have 90 minutes from when you start your attempt to submit your answers.
- Feedback is immediate regarding whether your answer is correct or incorrect but no detailed information on the process is given

Assessment Due Date

Week 9 Friday (18 Sept 2020) 5:00 pm AEST

Return Date to Students

Week 11 Friday (2 Oct 2020)

After 10 working days

Weighting

40%

Minimum mark or grade

20

Assessment Criteria

Each main steps in task will be assessed separately for the criterion *accuracy and correct results*.

- Correct application of mathematics and arithmetic
- Reference to correct Standards and/or principles
- Answers clearly identified
- Correct results

In addition, the assignment as a whole will be assessed against the following criteria:

Evidence of correct procedures

- All necessary steps in analysis are present in correct order

- Clear presentation of mathematical and arithmetical working linking given details of the problem to the results obtained
- Evidence of checking results (mathematical, graphical, logic-common sense)

Evidence of understanding of the topic

- Explanation of choices made in the analysis (why is procedure required, why this particular procedure)
- Interpretation of results, eg limitations, direction of vectors

Professional presentation

- The work (job) is clearly identified (problem, date, analysis)
- Clear statement of each problem and its details and requirements
- Logical layout of analysis
- Appropriate use of diagrams, clear diagrams
- Correct use of terminology, conventions
- Clear English in the explanation of procedure and interpretation of results.

Referencing Style

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

Submission

Online

Learning Outcomes Assessed

- Apply standard techniques to forecasting future traffic demand
- Design and document geometric alignments of transportation infrastructure using appropriate Australian guidelines
- Demonstrate a professional level of communication

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence
- Cross Cultural Competence
- Ethical practice

3 Pavement Design

Assessment Type

Written Assessment

Task Description

The aim of this assessment is to allow the students to demonstrate their understanding of various concepts, theories, and processes developed regarding pavement design covered in this unit.

This assessment (30% of the total unit marks) has two components

- Individual Design task (15%)
- Online Quiz (15%)

Individual Assignment

- This is a design task to allow students to demonstrate their understanding of pavement design in accordance to Australian standard.
- A *Project Brief* detailing the requirements will be made available on the unit's Moodle website in week 6.

Online Test

This assessment task consists of one online Test (Quizzes) covering topics of Weeks 9-12. 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;

- There will be between 10 and 20 Numerical questions;
- Questions will be randomly generated
- You are allowed a maximum of two attempts.
- The score will be the average grade from the number of attempts
- You have 90 minutes from when you start your attempt to submit your answers.
- Feedback is immediate regarding whether your answer is correct or incorrect but no detailed information on the process is given.

Assessment Due Date

Review/Exam Week Friday (16 Oct 2020) 5:00 pm AEST

Return Date to Students

After 10 working days

Weighting

30%

Minimum mark or grade

15

Assessment Criteria

Each main steps in task will be assessed separately for the criterion *accuracy and correct results*.

- Correct application of mathematics and arithmetic
- Reference to correct Standards and/or principles
- Answers clearly identified
- Correct results

In addition, the assignment as a whole will be assessed against the following criteria:

Evidence of correct procedures

- All necessary steps in analysis are present in correct order
- Clear presentation of mathematical and arithmetical working linking given details of the problem to the results obtained
- Evidence of checking results (mathematical, graphical, logic-common sense)

Evidence of understanding of the topic

- Explanation of choices made in the analysis (why is procedure required, why this particular procedure)
- Interpretation of results, eg limitations, direction of vectors

Professional presentation

- The work (job) is clearly identified (problem, date, analysis)
- Clear statement of each problem and its details and requirements
- Logical layout of analysis
- Appropriate use of diagrams, clear diagrams
- Correct use of terminology, conventions
- Clear English in the explanation of procedure and interpretation of results.

Referencing Style

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

Submission

Online

Learning Outcomes Assessed

- Evaluate the pavement sublayer materials properties using appropriate Australian guidelines
- Design a basic road pavements using appropriate Australian guidelines
- Demonstrate a professional level of communication

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence
- Cross Cultural Competence
- Ethical practice

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