



ENEC13016 Concrete Technology and Design

Term 2 - 2020

Profile information current as at 27/04/2024 07:39 am

All details in this unit profile for ENEC13016 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 you to the design of concrete structures, including structural components such as beams, slabs, columns, footings and retaining walls. You will identify loads and load paths for gravity and lateral loading. Construction materials are also reviewed in the context of sustainability and environmental issues. You will also plan, prepare and carry out tests on structural concrete components, interpret the results and prepare test reports. Building design and serviceability requirements are integrated in the design process. Individual and team work focuses on development of professionalism, ethical practice, problem solving and communication. Students enrolled in distance mode are required to attend a compulsory Residential School.

Details

Career Level: *Undergraduate*

Unit Level: *Level 3*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

Prerequisites: (ENEC12012 Stress Analysis or ENEC13010 Solid Mechanics) AND MATH11218 Applied 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
- Mixed Mode
- 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 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: 20%

2. **Practical and Written Assessment**

Weighting: 40%

3. **In-class Test(s)**

Weighting: 40%

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 unit evaluation

Feedback

Extremely an interesting unit and it is very relevant to the real world. The unit focused on directly working with the AS3600 standards and that increased skills to refer to the standards appropriately.

Recommendation

Glad to note students enjoyed the content and the delivery method. This will continue for the next offer.

Feedback from Moodle unit evaluation

Feedback

Assignments seemed realistic. Worked examples, tutorial questions practice helped in completing assessments. Edited videos helped to rewatch lectures.

Recommendation

Thanks for the feedback. Will continue the same service for future offerings as well.

Feedback from Moodle unit evaluation

Feedback

Responses on the Moodle forum / by email were excellent.

Recommendation

Thank you. Will continue to help students to my level best towards their learning.

Feedback from Moodle unit evaluation

Feedback

It makes it difficult for the lecturer to teach and students to learn if the technology isn't doing its job. Recordings with hand written notes are not clear for weeks.

Recommendation

The issue with the document camera was noted by the IT-section/helpdesk. Will take necessary steps to avoid this.

Feedback from Moodle unit evaluation

Feedback

Knowledge of the lecturer, industry guest lecture, practical work and the tech staff help and to learn from that is fantastic.

Recommendation

Thank you. Would like to continue it for the next offer.

Feedback from Moodle unit evaluation

Feedback

The midterm exam two hours is not sufficient time.

Recommendation

Noted the point. Will try to allocate more time if possible.

Unit Learning Outcomes

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

1. Select and specify materials for concrete structures in the context of sustainability and environmental issues and required structural performance
2. Determine identify load paths in structural systems for gravity and lateral loading
3. Explain the limit state design process and check for ultimate limit state and serviceability limit state requirements in reinforced concrete design
4. Design reinforced concrete beams, slabs, columns and retaining walls according to Australian Standard
5. Plan, test and interpret results of tests on structural materials and prepare test reports
6. Demonstrate a professional level of communication and teamwork

The learning outcomes are linked to Engineers Australia Stage 1 Competencies and also discipline capabilities. You can find the mapping for this on the [Engineering Undergraduate Course website](#).

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 - 20%	•	•	•	•		•
2 - In-class Test(s) - 40%	•	•	•	•		•
3 - Practical and Written Assessment - 40%	•	•	•	•	•	•

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			•	•	•	•

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6
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 - Written Assessment - 20%	•	•	•	•		•	•	•		
2 - In-class Test(s) - 40%		•	•	•			•			
3 - Practical and Written Assessment - 40%	•	•	•	•	•	•	•	•		

Textbooks and Resources

Textbooks

ENEC13016

Supplementary

Reinforced and Prestressed Concrete

3rd Edition (2018)

Authors: Yew-Chaye Loo and Sanaul Huq Chowdhury

Cambridge University Press

ISBN: 9781108405645

Binding: Hardcover

Additional Textbook Information

This textbook is written in accordance with Australian Standard AS3600-2009. However, the AS3600 Standard was revised and the current version (AS3600-2018) is released in 2018. Therefore, the above-mentioned textbook may not use the design procedure as per the current version of AS3600-2018.

Students will be supplied an Errata that was prepared by the authors/publishers in accordance with AS3600-2018 (available from the unit website) if the students wish to use the textbook.

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

Kumaran Suntharavadivel Unit Coordinator
t.suntharavadivel@cqu.edu.au

Schedule

Week 1 - 13 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
Concrete Technology <ul style="list-style-type: none">• Cement, Aggregates• Concrete Mix Design• Curing Process Concrete Constructions <ul style="list-style-type: none">• Handling and Placing concrete• Testing of Concrete		

Week 2 - 20 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
Introduction of RC Design <ul style="list-style-type: none">• Limit State Design and Load Combinations• Design Properties of Concrete and Reinforcement• Durability and Fire Resistance• Structural Analysis		

Week 3 - 27 Jul 2020

Module/Topic	Chapter	Events and Submissions/Topic
Design of Rectangular Beam I <ul style="list-style-type: none">• Ultimate Limit State requirements• Serviceability Limit State requirements		

Week 4 - 03 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Design of Rectangular Beam II <ul style="list-style-type: none">• Ultimate Limit State requirements• Serviceability Limit State requirements		

Week 5 - 10 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Design of T-Beams and irregular shapes		Assessment item1 -

Vacation Week - 17 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
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Week 6 - 24 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Design of Slab (one-way and two-way slab)		Assignment 1 Due: Week 6 Tuesday (25 Aug 2020) 5:00 pm AEST

Week 7 - 31 Aug 2020

Module/Topic	Chapter	Events and Submissions/Topic
Design of Suspended Slabs		

Week 8 - 07 Sep 2020		
Module/Topic	Chapter	Events and Submissions/Topic
Design of Columns I		
Week 9 - 14 Sep 2020		
Module/Topic	Chapter	Events and Submissions/Topic
Design of Columns II		Assessment item 2- Class
Week 10 - 21 Sep 2020		
Module/Topic	Chapter	Events and Submissions/Topic
Design of Walls and Footings		
Week 11 - 28 Sep 2020		
Module/Topic	Chapter	Events and Submissions/Topic
Strut-and-tie Modelling		
Week 12 - 05 Oct 2020		
Module/Topic	Chapter	Events and Submissions/Topic
Revision		Mini Project and Practical Report Due: Week 12 Tuesday (6 Oct 2020) 5:00 pm AEST
Review/Exam Week - 12 Oct 2020		
Module/Topic	Chapter	Events and Submissions/Topic
		Assessment item 3
Exam Week - 19 Oct 2020		
Module/Topic	Chapter	Events and Submissions/Topic
		End-of-term Test (online) Due: Exam Week Monday (19 Oct 2020) 11:45 pm AEST

Term Specific Information

Due to COVID19 travel restrictions, laboratory/residential school activities are delivered via online mode (a combination of recorded videos and zoom interactive session) during this term, unless the university has advised otherwise as per government's instruction. Participation in this activity is compulsory for Assessment item 2. In-Class Test will be conducted as an online test during the examination week. Read **ENEC13016: General Information** available from the unit website.

Assessment Tasks

1 Assignment 1

Assessment Type

Written Assessment

Task Description

This Assignment contained small design questions and a small essay type questions. Contents covered until Week 5 (inclusive) included in this assessment.

Assignment 1 will be available on Monday Week 2.

Assessment Due Date

Week 6 Tuesday (25 Aug 2020) 5:00 pm AEST

Return Date to Students

Week 8 Wednesday (9 Sept 2020)

Weighting

20%

Assessment Criteria

Each question will be assessed for the criterion accuracy and correct answers.

- Correct application of mathematics and arithmetic
- Answers clearly identified and explained
- Correct results/explanation

In addition, the following criteria also will be considered:

Evidence of correct procedures

- All necessary steps in the analysis are followed in the correct order
- Clear presentation of mathematical working

Evidence of an understanding of the topic

- Use of correct principles and theories
- Interpretation of results as necessary

Professional presentation

- 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

Submission Instructions

One single file (PDF is preferred)

Learning Outcomes Assessed

- Select and specify materials for concrete structures in the context of sustainability and environmental issues and required structural performance
- Determine identify load paths in structural systems for gravity and lateral loading
- Explain the limit state design process and check for ultimate limit state and serviceability limit state requirements in reinforced concrete design
- Design reinforced concrete beams, slabs, columns and retaining walls according to Australian Standard
- Demonstrate a professional level of communication and teamwork

Graduate Attributes

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

2 Mini Project and Practical Report

Assessment Type

Practical and Written Assessment

Task Description

This assessment has two sections;

1. A mini project on RC Design: Students will asked to design a small RC structure (main structural elements such as Slab, Beam and Column) as per requirements. Detail of this project will be available on Friday, Week 5
2. Practical Report - attendance in-person or zoom session is compulsory

Assessment Due Date

Week 12 Tuesday (6 Oct 2020) 5:00 pm AEST

Return Date to Students

Review/Exam Week Friday (16 Oct 2020)

Weighting

40%

Minimum mark or grade

25%

Assessment Criteria

Each question will be assessed for the criterion accuracy and correct answers.

- Correct application of mathematics and arithmetic
- Answers clearly identified and explained
- Correct results/explanation

In addition, the following criteria also will be considered:

Evidence of correct procedures

- All necessary steps in the analysis are followed in the correct order
- Clear presentation of mathematical working

Evidence of an understanding of the topic

- Use of correct principles and theories
- Interpretation of results as necessary

Professional presentation

- 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

Submission Instructions

Two separate files for each sections (PDF is preferred)

Learning Outcomes Assessed

- Select and specify materials for concrete structures in the context of sustainability and environmental issues and required structural performance
- Determine identify load paths in structural systems for gravity and lateral loading
- Explain the limit state design process and check for ultimate limit state and serviceability limit state requirements in reinforced concrete design
- Design reinforced concrete beams, slabs, columns and retaining walls according to Australian Standard
- Plan, test and interpret results of tests on structural materials and prepare test reports
- Demonstrate a professional level of communication and teamwork

Graduate Attributes

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

3 End-of-term Test (online)**Assessment Type**

In-class Test(s)

Task Description

End-of-Term Examination will be conducted in the form of an online test during examination week.

Duration of the Test: 3 hours

Important: Students need to complete this online test at the prescribed time (notified via unit Moodle site). It is expected the student should have their web-camera for invigilation during the test.

Students may require to submit their workings on the conclusion of the examination (Scanned copy).

Assessment Due Date

Exam Week Monday (19 Oct 2020) 11:45 pm AEST

Date and time will be notified via Moodle site

Return Date to Students

Marks will be released on 4th November 2020

Weighting

40%

Minimum mark or grade

50%

Assessment Criteria

Each question will be assessed for the criterion accuracy and correct answers.

- Correct application of mathematics and arithmetic
- Answers clearly identified and explained
- Correct results/explanation

In addition, the following criteria also will be considered:

Evidence of correct procedures

- All necessary steps in the analysis are followed in the correct order
- Clear presentation of mathematical working

Evidence of an understanding of the topic

- Use of correct principles and theories
- Interpretation of results as necessary

Professional presentation

- 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

Submission Instructions

Upload single file

Learning Outcomes Assessed

- Select and specify materials for concrete structures in the context of sustainability and environmental issues and required structural performance
- Determine identify load paths in structural systems for gravity and lateral loading
- Explain the limit state design process and check for ultimate limit state and serviceability limit state requirements in reinforced concrete design
- Design reinforced concrete beams, slabs, columns and retaining walls according to Australian Standard
- Demonstrate a professional level of communication and teamwork

Graduate Attributes

- Problem Solving
- Critical Thinking
- Information Literacy

- Cross Cultural 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