



# ENEC13016 Concrete Technology and Design

## Term 2 - 2017

Profile information current as at 16/05/2024 02:22 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 - 2017

- Bundaberg
- Distance
- Gladstone
- Mackay
- 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. **In-class Test(s)**

Weighting: 40%

#### 3. **Practical and Written Assessment**

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](#).

## 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
<b>9 - Social Innovation</b>						
<b>10 - Aboriginal and Torres Strait Islander Cultures</b>						

## Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
<b>1 - Written Assessment - 20%</b>	•	•	•	•		•	•	•		
<b>2 - In-class Test(s) - 40%</b>		•	•	•			•			
<b>3 - Practical and Written Assessment - 40%</b>	•	•	•	•	•	•	•	•		

## Textbooks and Resources

### Textbooks

ENEC13016

#### Prescribed

#### Reinforced concrete basics

Edition: 2nd edn (2010)

Authors: Warner, RR, Foster, SJ & Kilpatrick, AE

Pearson Education

Sydney , NSW , Australia

ISBN: 9781442538450

Binding: Paperback

[View textbooks at the CQUniversity Bookshop](#)

### 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

**Remadevi Dhanasekar** Unit Coordinator

[r.dhanasekar@cqu.edu.au](mailto:r.dhanasekar@cqu.edu.au)

## Schedule

### Week 1 - 10 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Materials of construction and mix design		

### Week 2 - 17 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Theory of Serviceability Behaviour of Reinforced Concrete under Flexure		

### Week 3 - 24 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Theory of Serviceability Behaviour of Reinforced Concrete under Flexure		

### Week 4 - 31 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Flexural Capacity of RC Beams - Singly & Doubly reinforced rectangular beams and T beams.		

### Week 5 - 07 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Flexural Capacity of RC Beams - Singly & Doubly reinforced rectangular beams and T beams.		<p>Assessment item1 - Assignment Due Wednesday (05 Apr 17) 05:00 PM AEST</p> <p><b>Written Assessment</b> Due: Week 5 Wednesday (9 Aug 2017) 5:00 pm AEST</p>

### Vacation Week - 14 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
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### Week 6 - 21 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Analysis and Design of RC Beams for Shear		

### Week 7 - 28 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Design of RC Slabs - one way & Two way slabs		

### Week 8 - 04 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Design of RC Slabs - one way & Two way slabs		

### Week 9 - 11 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
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Design of RC columns -  
Short and slender

Assessment item 2- Class  
Test Due Friday (12 May 17)  
11:00 AM AEST

**In-class Test** Due: Week 9 Friday (15  
Sept 2017) 5:00 pm AEST

#### Week 10 - 18 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Design of RC columns - Short and slender		

#### Week 11 - 25 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Design of Footings		

#### Week 12 - 02 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic
Design of Retaining wall		

#### Review/Exam Week - 09 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic
		Assessment item 3 - Assignment Due Wednesday (07 Jun 17) 05:00 PM AEST
		<b>Practical and Written Assessment</b> Due: Review/Exam Week Wednesday (11 Oct 2017) 5:00 pm AEST

#### Exam Week - 16 Oct 2017

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

### 1 Written Assessment

#### Assessment Type

Written Assessment

#### Task Description

This assessment has questions from weeks 1 to 3 content and include theory and design questions. Question will be available via the course web site at the beginning of the term.

#### Assessment Due Date

Week 5 Wednesday (9 Aug 2017) 5:00 pm AEST

#### Return Date to Students

Grade and feedback will be uploaded on the course web site on or before Week-7, Wednesday.

#### Weighting

20%

#### Minimum mark or grade

Minimum mark or grade - Pass - 10 marks which is 50% of the total allotted marks for this assessment item.

#### Assessment Criteria

Assessment Criteria

(5 %) Presentation and layout—includes the selection of typeface, written and general appearance, detail and quality of the assessment item submission

(95%) Content—includes the accuracy and relevance of information, application of knowledge, language and grammar used in answering questions, and proper referencing of sources of information, equations, images, data and tables used in the assessment submission. When referencing, use of the Harvard Referencing System

## Referencing Style

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

## Submission

Online

## Submission Instructions

Required format is a single word file. Mathematical calculation can be in hand-written format; students should scan the hand-written calculation and insert/paste it within the word file at the appropriate location.

## 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 In-class Test

### Assessment Type

In-class Test(s)

### Task Description

This assessment cover the content from weeks 4 to 8. Assessment questions include theory and design of structural members . This assessment is of open book format and the duration is 2 hours. Students need to bring their own stationary.

### Assessment Due Date

Week 9 Friday (15 Sept 2017) 5:00 pm AEST

### Return Date to Students

Grade and feedback will be uploaded on the course web site on or before Week-11, Thursday.

### Weighting

40%

### Minimum mark or grade

Minimum mark or grade - Pass - 20 marks which is 50% of the total allotted marks for this assessment item.

### Assessment Criteria

(100% ) Content—includes the accuracy and relevance of information, application of knowledge, language and grammar used in answering questions, and proper referencing of sources of information, equations, images, data and tables used in answering questions.

## Referencing Style

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

## Submission

Offline

## Submission Instructions

In-Class test . Hard copy Use pen or 2B pencil

## 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

### **3 Practical and Written Assessment**

#### **Assessment Type**

Practical and Written Assessment

#### **Task Description**

This assessment has questions from weeks 9 to 12 content, laboratory and industry visit and include theory and design questions. Assessment questions and Laboratory activities details and report format will be provided to all students on or before week-5

#### **Assessment Due Date**

Review/Exam Week Wednesday (11 Oct 2017) 5:00 pm AEST

#### **Return Date to Students**

Grade and feedback will be uploaded on the course web site during University vacation period, on or before 01 Nov 2017

#### **Weighting**

40%

#### **Minimum mark or grade**

Minimum mark or grade - Pass - 20 marks which is 50% of the total allotted marks for this assessment item.

#### **Assessment Criteria**

Assessment Criteria

(5 %) Presentation and layout—includes the selection of typeface, written and general appearance, detail and quality of the assessment item submission

(95%) Content—includes the accuracy and relevance of information, application of knowledge, language and grammar used in answering questions, and proper referencing of sources of information, equations, images, data and tables used in the assessment submission. When referencing, use of the Harvard Referencing System

#### **Referencing Style**

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

#### **Submission**

Online

#### **Submission Instructions**

Required format is a single word file. Mathematical calculation can be in hand-written format; Students should scan the hand-written calculation and insert/paste it within the word file at the appropriate location.

#### **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

## 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