



CIVL3301

Design of Concrete Structures

Session 1, In person-scheduled-weekday, North Ryde 2025

School of Engineering

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General Information

Unit convenor and teaching staff

Convenor and Lecturer

Sorn Vimonsatit

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Contact via email

44WTR-103

by appointment

Credit points

10

Prerequisites

130cp at 1000 level or above and CIVL2301

Corequisites

Co-badged status

Unit description

This unit develops skills in analysing and designing reinforced concrete members for bending, shear, torsion, and combined loads. Students will study concrete properties, reinforcement, and design principles for beams, columns, slabs, and prestressed concrete, focusing on safety, strength, and serviceability. This unit is essential preparation for fourth-year structural projects and theses, while aligning with the UN Sustainable Development Goals (UNSDGs) in Industry, Innovation, and Infrastructure.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

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

ULO1: convey sound knowledge of the theory, concepts, and principles in concrete structural design

ULO2: comprehend the design of reinforced concrete sections under bending, shear and torsion

ULO3: perform qualitative and quantitative prediction of the design capacities of reinforced concrete members

ULO4: communicate clearly and professionally the design outcomes of reinforced concrete structures

ULO5: demonstrate transferable skills (team player, self-management, time-management, professionalism, and compliance with ethical codes of conducts)

Assessment Tasks

Name	Weighting	Hurdle	Due
Final Examination	30%	No	Examination Week
Problem set	20%	No	On-going
Reinforced Concrete Design	50%	No	Weeks 7 & 13

Final Examination

Assessment Type ¹: Examination

Indicative Time on Task ²: 25 hours

Due: **Examination Week**

Weighting: **30%**

Final examination assessing the content throughout the semester

On successful completion you will be able to:

- convey sound knowledge of the theory, concepts, and principles in concrete structural design
- comprehend the design of reinforced concrete sections under bending, shear and torsion
- perform qualitative and quantitative prediction of the design capacities of reinforced concrete members
- communicate clearly and professionally the design outcomes of reinforced concrete structures

Problem set

Assessment Type ¹: Problem set

Indicative Time on Task ²: 15 hours

Due: **On-going**

Weighting: **20%**

Students will complete a series of problem sets designed to apply the concepts and skills learned throughout this unit. This assessment will be invigilated to ensure academic integrity and to provide a structured environment for students to demonstrate their understanding.

On successful completion you will be able to:

- comprehend the design of reinforced concrete sections under bending, shear and torsion
- perform qualitative and quantitative prediction of the design capacities of reinforced concrete members
- communicate clearly and professionally the design outcomes of reinforced concrete structures

Reinforced Concrete Design

Assessment Type ¹: Project

Indicative Time on Task ²: 30 hours

Due: **Weeks 7 & 13**

Weighting: **50%**

Project task includes a reinforced concrete design project and lab-based activities during practical classes.

On successful completion you will be able to:

- convey sound knowledge of the theory, concepts, and principles in concrete structural design
- comprehend the design of reinforced concrete sections under bending, shear and torsion
- perform qualitative and quantitative prediction of the design capacities of reinforced concrete members
- communicate clearly and professionally the design outcomes of reinforced concrete structures
- demonstrate transferable skills (team player, self-management, time-management, professionalism, and compliance with ethical codes of conducts)

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment

- the [Writing Centre](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Teaching and Learning materials are accessible via the Unit's iLearn page.

Lectures are online 2 hours per week.

SGTAs 2 hours per week.

Practicals 2 hours per week (2 weeks of Lab work; and other weeks are for associated work).

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#) (<https://policies.mq.edu.au>). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

Students seeking more policy resources can visit [Student Policies](#) (<https://students.mq.edu.au/support/study/policies>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit [Policy Central](#) (<https://policies.mq.edu.au>) and use the [search tool](#).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit connect.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Academic Success

[Academic Success](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

Student Services and Support

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)
- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via the [Service Connect Portal](#), or contact [Service Connect](#).

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

Engineers Australia Stage 1 Competency Mapping

EA Competency Standard		Unit Learning Outcomes
Knowledge and Skill Base	1.1 Comprehensive, theory-based understanding of the underpinning fundamentals applicable to the engineering discipline.	ULO1, ULO2
	1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing.	ULO1, ULO2
	1.3 In-depth understanding of specialist bodies of knowledge	ULO1, ULO2, ULO3
	1.4 Discernment of knowledge development and research directions	ULO1, ULO3
	1.5 Knowledge of engineering design practice	ULO1, ULO3
	1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice.	ULO2, ULO3
Engineering Application Ability	2.1 Application of established engineering methods to complex problem solving	
	2.2 Fluent application of engineering techniques, tools and resources.	ULO2
	2.3 Application of systematic engineering synthesis and design processes.	ULO3
	2.4 Application of systematic approaches to the conduct and management of engineering projects.	
Professional and Personal Attributes	3.1 Ethical conduct and professional accountability.	ULO5
	3.2 Effective oral and written communication in professional and lay domains.	ULO4
	3.3 Creative, innovative and pro-active demeanour.	ULO4, ULO5
	3.4 Professional use and management of information.	ULO4, ULO5
	3.5 Orderly management of self, and professional conduct.	ULO4, ULO5
	3.6 Effective team membership and team leadership	ULO4, ULO5

Unit information based on version 2025.02 of the [Handbook](#)