



# CIVL8202

## Integrated Structural Design and Construction

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

*School of Engineering*

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#### **Disclaimer**

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## General Information

Unit convenor and teaching staff

Unit Convenor

Sorn Vimonsatit

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44 WTR

by Appointment

Credit points

10

Prerequisites

Corequisites

Co-badged status

Unit description

This unit delves into various construction materials such as concrete, steel, and timber, along with the foundational principles guided by Australian design codes. It then extends these concepts to advanced structural design and construction applications. Reinforced concrete, steel, and timber principles are expanded upon, specifically in relation to designing buildings, bridges, and specialized structures. The unit encompasses an integrated project that combines structural design and construction. This project involves individual and group work to develop, compare, and select design concepts that fulfill project requirements and site conditions. The design process incorporates advanced theoretical and technical insights in structural engineering to formulate a structural system that aligns with relevant design standards. Aspects related to construction techniques and methods are also addressed in the project's development.

Learning in this unit enhances student understanding of global challenges identified by the United Nations Sustainable Development Goals ([UNSDGs](#)) Industry, Innovation and Infrastructure; Sustainable Cities and Communities

## 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:** Create and complete an authentic design and construction project by critically analysing and evaluating the project in accordance with structural analysis and design principles, relevant codes of practice, and appropriate construction methods.

**ULO2:** Critically review structural design inputs, and generate ideas and processes for solutions to complex problems, environmental impacts and sustainability goals.

**ULO3:** Apply advanced technical knowledge and problem-solving skills to achieve project goals

**ULO4:** Professionally communicate and collaborate with others by effectively transferring and exchanging knowledge and ideas in verbal, written, and digital forms

**ULO5:** Plan and manage structural design and construction projects with creativity and innovation

**ULO6:** Demonstrate high levels of leadership and teamwork skills with an awareness of ethical choices consequences and safety.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<a href="#">Project report</a>	40%	No	Weeks 7 & 13
<a href="#">Problems</a>	30%	No	Weekly
<a href="#">Project presentation</a>	30%	No	Weeks 6 & 12

### Project report

Assessment Type <sup>1</sup>: Project

Indicative Time on Task <sup>2</sup>: 24 hours

Due: **Weeks 7 & 13**

Weighting: **40%**

The project report is to present the overall report based on the group work and individual work components.

On successful completion you will be able to:

- Create and complete an authentic design and construction project by critically analysing and evaluating the project in accordance with structural analysis and design principles, relevant codes of practice, and appropriate construction methods.
- Critically review structural design inputs, and generate ideas and processes for solutions

to complex problems, environmental impacts and sustainability goals.

- Apply advanced technical knowledge and problem-solving skills to achieve project goals
- Professionally communicate and collaborate with others by effectively transferring and exchanging knowledge and ideas in verbal, written, and digital forms
- Plan and manage structural design and construction projects with creativity and innovation
- Demonstrate high levels of leadership and teamwork skills with an awareness of ethical choices consequences and safety.

## Problems

Assessment Type <sup>1</sup>: Problem set

Indicative Time on Task <sup>2</sup>: 17 hours

Due: **Weekly**

Weighting: **30%**

To be issued every two weeks or so for individually monitoring work progress and assessing the knowledge and project outcomes

On successful completion you will be able to:

- Create and complete an authentic design and construction project by critically analysing and evaluating the project in accordance with structural analysis and design principles, relevant codes of practice, and appropriate construction methods.
- Critically review structural design inputs, and generate ideas and processes for solutions to complex problems, environmental impacts and sustainability goals.
- Professionally communicate and collaborate with others by effectively transferring and exchanging knowledge and ideas in verbal, written, and digital forms
- Plan and manage structural design and construction projects with creativity and innovation
- Demonstrate high levels of leadership and teamwork skills with an awareness of ethical choices consequences and safety.

## Project presentation

Assessment Type <sup>1</sup>: Presentation

Indicative Time on Task <sup>2</sup>: 18 hours

Due: **Weeks 6 & 12**

Weighting: **30%**

The project is presented individually, reflecting each member's assigned tasks and actual contributions.

On successful completion you will be able to:

- Critically review structural design inputs, and generate ideas and processes for solutions to complex problems, environmental impacts and sustainability goals.
- Apply advanced technical knowledge and problem-solving skills to achieve project goals
- Professionally communicate and collaborate with others by effectively transferring and exchanging knowledge and ideas in verbal, written, and digital forms
- Plan and manage structural design and construction projects with creativity and innovation
- Demonstrate high levels of leadership and teamwork skills with an awareness of ethical choices consequences and safety.

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<sup>1</sup> 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.

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

## **Policies and Procedures**

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](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 \(https://students.mq.edu.au/support/study/policies\)](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 \(https://policies.mq.edu.au\)](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](https://connect.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto: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/](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, and accountabilities of sustainable engineering practice.	ULO2, ULO3

## Unit guide CIVL8202 Integrated Structural Design and Construction

Engineering Application Ability	2.1 Application of established engineering methods to complex problem solving	ULO3
	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.	ULO1, ULO5
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 proactive demeanour.	ULO4, ULO5, ULO6
	3.4 Professional use and management of information.	ULO4, ULO5, ULO6
	3.5 Orderly management of self, and professional conduct.	ULO4, ULO5, ULO6
	3.6 Effective team membership and team leadership	ULO4, ULO5, ULO6

Unit information based on version 2025.03 of the [Handbook](#)