



# Unit Outline (Higher Education)

**Institute / School:** Institute of Innovation, Science & Sustainability

**Unit Title:** STRUCTURAL DESIGN

**Unit ID:** ENGIN3201

**Credit Points:** 15.00

**Prerequisite(s):** (ENCIV2310 or ENGIN2203)

**Co-requisite(s):** Nil

**Exclusion(s):** (ENCIV3310)

**ASCED:** 030903

**Description of the Unit:**

This unit introduces students to the structural design of steel beams and columns and reinforced concrete beams and slabs, in accordance with applicable Australian Standards. The design principles which underpin the code provisions are described and explained and, upon completion of the unit, students should be able to competently undertake design of simple steel and reinforced concrete elements in practical situations.

**Grade Scheme:** Graded (HD, D, C, P, MF, F, XF)

**Work Experience:**

No work experience: Student is not undertaking work experience in industry.

**Placement Component:** No

**Supplementary Assessment:** Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment

**Course Level:**

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Learning Outcomes:**

On successful completion of the course the students are expected to be able to:

**Knowledge:**

- K1.** Identify the types of failures possible in steel and reinforced concrete structural elements and connections
- K2.** Apply the principles of strength limit state design to the design of steel beams and columns
- K3.** Apply the principles of strength limit state design to the design of reinforced concrete beams and slabs.
- K4.** Recognise and explain the design factors which need to be considered in order to achieve durable reinforced concrete structures in a range of environmental conditions

**Skills:**

- S1.** Demonstrate competence in utilizing Australian Standards, relevant design guidelines and design handbooks where they are appropriate and applicable
- S2.** Create a report outlining the outcomes of engineering design computations to a professional standard
- S3.** Produce and communicate, by graphical means, the results of the design process in a way which is useful and convenient for those required to transform the design onto reality

**Application of knowledge and skills:**

- A1.** Propose structural designs for steel beams and columns in accordance with AS4100 with regard to various requirements such as safety, economy and durability
- A2.** Propose structural designs for reinforced concrete beams and slabs in accordance with AS3600 and with regard to various requirements such as safety, economy and durability.

**Unit Content:**

Topics may include:

- Design of steel beams to AS4100 on the basis of stiffness and strength (bending, shear, bearing, deflection)
- Design of simple steel members under compression or tension to AS4100

**Learning Task and Assessment:**

- Design of steel beams to AS4100 on the basis of stiffness and strength (bending, shear, bearing, deflection)
- Design of simple steel members under compression or tension to AS4100

**Adopted Reference Style:**

Refer to the [library website](#) for more information

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