



Unit Outline (Higher Education)

Institute / School: Institute of Innovation, Science & Sustainability

Unit Title: ADVANCED STRUCTURAL ANALYSIS I

Unit ID: ENGIN5202

Credit Points: 15.00

Prerequisite(s): (ENGIN3201)

Co-requisite(s): Nil

Exclusion(s): Nil

ASCED: 030903

Description of the Unit:

This unit equips participants with advanced theoretical and technical knowledge and skills in the area of structural design. After having successfully completed the unit, participants will gain the skills for structural engineering work.

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	■	■	■	■	■	■
Intermediate	■	■	■	■	■	■

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

Learning Outcomes:

Upon successful completion of this unit, students should be able to:

Knowledge:

- K1.** Discern the principles of design of steel frame buildings, as total systems and with regard to the design of individual components
- K2.** Identify the considerations and processes in the design of various types of reinforced concrete slab systems, foundations and columns for strength
- K3.** Identify the considerations and processes in the design of reinforced concrete beams and slabs for deflection control
- K4.** Recognise methods of construction, design principles and the approaches to the design of prestressed concrete

Skills:

- S1.** Create well-communicated and professional high-quality documents presenting analysis and design computations and computer modelling details and outcomes.
- S2.** Develop computer models of complex structural systems and validate the results by independent manual means
- S3.** Exercise informed judgement in making structural design decisions
- S4.** Demonstrate effective teamwork in the completion of structural design tasks

Application of knowledge and skills:

- A1.** Design steel/portal frame buildings, with due regard for relevant Australian Standards and contemporary construction practices
- A2.** Design reinforced concrete flat slab floors and foundations for buildings, on the basis of flexure and two-way shear
- A3.** Produce calculations and checks which will ensure that reinforced concrete beams and slabs comply with appropriate deflection controls
- A4.** Design all aspects of reinforced concrete columns under given loads, on the basis of AS3600
- A5.** Develop the preliminary design of the prestressing requirements for concrete floors in buildings, on the basis of AS3600 and with due regard for current industry practice

Unit Content:

Topics may include:

- Design of steel members under combined actions and steel frame buildings
- Design of reinforced concrete two-way and flat slabs for flexure and shear
- Deflection of reinforced concrete beams and slabs
- Design aspects of reinforced concrete foundations
- Introduction to design of prestressed concrete

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1-K4, S1-S3, A1-A5	Design excercises	Design reports	40%-50%
K1-K4, S3, A1-A5	Tutorial problems, tests, exams	Examination or Class Tests	50%-60%

Adopted Reference Style:

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

Fed Cite - [referencing tool](#)