



Unit Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Unit Title:	Construction Engineering 1
Unit ID:	ENGRG2101
Credit Points:	15.00
Prerequisite(s):	(ENGRG1004)
Co-requisite(s):	Nil
Exclusion(s):	(ENGIN2202)
ASCED:	030999

Description of the Unit:

This unit introduces students to the fundamentals of concrete technology, covering its essential properties and applications. Students explore concrete basics, durability, mix design, and techniques for addressing common defects. Through theory and laboratory practice, students learn to assess concrete properties, ensuring suitability for diverse construction projects. Additionally, students delve into vital aspects of building and bridge construction, as well as residential sub-division development.

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

Work Experience:

No work experience

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:



Lovel of Unit in Course	AQF Level of Course						
Level of onit in course	5	6	7	8	9	10	
Introductory							
Intermediate			~				
Advanced							

Learning Outcomes:

Knowledge:

- **K1.** Describe the constituents of concrete and their influence on concrete properties.
- **K2.** Explain the plastic and hardened-state properties of concrete and their assessment methods.
- **K3.** Outline the fundamental principles and considerations involved in the design and construction of building elements and infrastructure.

Skills:

- **S1.** Perform laboratory-based tests to assess concrete properties accurately.
- **S2.** Organize construction activities for residential sub-division projects in a logical sequence.

Application of knowledge and skills:

- **A1.** Specify appropriate concrete properties for specific applications, considering factors such as strength and durability.
- **A2.** Identify common defects in concrete construction and propose solutions based on engineering principles.
- **A3.** Evaluate construction methods and materials for foundations, floors, roofs, walls, and infrastructure components, emphasizing suitability and practicality.

Unit Content:

Topics may include:

- 1. Concrete basics
- 2. Durability of concrete
- 3. Control of cracking of concrete structures
- 4. Concrete mix design
- 5. Concreting in hot and cold weather
- 6. Building construction: foundation, floor systems, roof and wall construction
- 7. Introduction to bridge engineering
- 8. Sub-division construction

FEDTASKS

Federation University Federation recognises that students require key transferable employability skills to prepare them for their future workplace and society. FEDTASKS (**T**ransferable **A**ttributes **S**kills and **K**nowledge) provide a targeted focus on five key transferable Attributes, Skills, and Knowledge that are be embedded within curriculum, developed gradually towards successful measures and interlinked with cross-discipline and Co-operative Learning opportunities. One or more FEDTASK, transferable Attributes, Skills or Knowledge must be evident in the specified learning outcomes and assessment for each FedUni Unit, and all must be directly assessed in each Course.



FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit		
		Learning Outcomes (KSA)	Assessment task (AT#)	
FEDTASK 1 Interpersonal	 Students will demonstrate the ability to effectively communicate, inter-act and work with others both individually and in groups. Students will be required to display skills inperson and/or online in: Using effective verbal and non-verbal communication Listening for meaning and influencing via active listening Showing empathy for others Negotiating and demonstrating conflict resolution skills Working respectfully in cross-cultural and diverse teams. 	Not applicable	Not applicable	
FEDTASK 2 Leadership	 Students will demonstrate the ability to apply professional skills and behaviours in leading others. Students will be required to display skills in: Creating a collegial environment Showing self -awareness and the ability to self-reflect Inspiring and convincing others Making informed decisions Displaying initiative 	Not applicable	Not applicable	
FEDTASK 3 Critical Thinking and Creativity	 Students will demonstrate an ability to work in complexity and ambiguity using the imagination to create new ideas. Students will be required to display skills in: Reflecting critically Evaluating ideas, concepts and information Considering alternative perspectives to refine ideas Challenging conventional thinking to clarify concepts Forming creative solutions in problem solving. 	Not applicable	Not applicable	
FEDTASK 4 Digital Literacy	 Students will demonstrate the ability to work fluently across a range of tools, platforms and applications to achieve a range of tasks. Students will be required to display skills in: Finding, evaluating, managing, curating, organising and sharing digital information Collating, managing, accessing and using digital data securely Receiving and responding to messages in a range of digital media Contributing actively to digital teams and working groups Participating in and benefiting from digital learning opportunities. 	Not applicable	Not applicable	
FEDTASK 5 Sustainable and Ethical Mindset	 Students will demonstrate the ability to consider and assess the consequences and impact of ideas and actions in enacting ethical and sustainable decisions. Students will be required to display skills in: Making informed judgments that consider the impact of devising solutions in global economic environmental and societal contexts Committing to social responsibility as a professional and a citizen Evaluating ethical, socially responsible and/or sustainable challenges and generating and articulating responses Embracing lifelong, life-wide and life-deep learning to be open to diverse others Implementing required actions to foster sustainability in their professional and personal life. 	Not applicable	Not applicable	

Learning Task and Assessment:



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ENGRG2101 CONSTRUCTION ENGINEERING 1

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1, K2, K3, S2, A1, A2	Participate in all learning activities including attendance and participation in classes, exercises, recommended and supplementary readings or other activities. Undertake problem solving of engineering problems relevant to concrete technology and construction engineering in both invigilated and non-invigilated settings.	Tests, Quizzes and Assignments	30% - 50%
K1, S1, A1	Practical exercise in concrete technology	Laboratory report	20% - 40%
S2, A2, A3	Case study related to a building, bridge, road or subdivision construction	Report and presentation	20% - 40%

Adopted Reference Style:

IEEE ()

Refer to the library website for more information

Fed Cite - referencing tool