COURSE OUTLINE

CIV302 Concrete Design and Technology

School: School of Science, Technology and Engineering

2026 | Trimester 2

UniSC Sunshine Coast
UniSC Moreton Bay

BLENDED LEARNING

Most of your course is on campus but you may be able to do some components of this course online.

Please go to unisc.edu.au for up to date information on the teaching sessions and campuses where this course is usually offered.

1. What is this course about?

1.1. Description

Civil engineers need to design concrete structures and infrastructures that adhere to regulatory standards. This course focuses on the design of reinforced concrete structures and their components, such as beams, slabs and columns, while considering both serviceability and ultimate limit states. You will learn to effectively design these structures and their members, ensuring compliance with the Australian Standard AS 3600. Additionally, the course covers the proper detailing of reinforcement for these structures and members.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Learning materials – Asynchronous weekly learning material	2hrs	Week 1	12 times
Tutorial/Workshop 1 – Online workshops	1hr	Week 1	12 times
Tutorial/Workshop 2 – On campus	2hrs	Week 1	12 times
Laboratory 1 – On campus	1hr	Week 9	3 times

1.3. Course Topics

Topics May include:

- Introduction to Concrete Structures and Design Procedures
- Design of Reinforced Concrete Beams to Limit States according to AS 3600
- Design of Reinforced Concrete Slabs to Limit States according to AS 3600
- Design of Reinforced Concrete Columns to Limit States according to AS 3600
- Structural Analysis of Concrete Structures

2. What level is this course?

300 Level (Graduate)

Demonstrating coherence and breadth or depth of knowledge and skills. Independent application of knowledge and skills in unfamiliar contexts. Meeting professional requirements and AQF descriptors for the degree. May require pre-requisites where discipline specific introductory or developing knowledge or skills is necessary. Normally undertaken in the third or fourth full-time study year of an undergraduate program.

3. What is the unit value of this course?

12 units

4. How does this course contribute to my learning?

COURSE LEARNING OUTCOMES	GRADUATE QUALITIES MAPPING	PROFESSIONAL STANDARD MAPPING *
On successful completion of this course, you should be able to...	Completing these tasks successfully will contribute to you becoming...	Competencies from multiple Professional Bodies (see below) *
1 Describe and explain the nature of concrete and steel, and how they work as a composite members i.e. reinforced concrete.	Knowledgeable Empowered	1.1.a, 1.1, 1.2
2 Use and apply design codes e.g. AS/NZS 1170.0, AS/NZS 1170.1 and AS 3600; determine design loads and load combinations for strength and serviceability and understand their importance in limit state design.	Knowledgeable Ethical	1, 1.3.a, 1.3, 2, 2.1.g, 2.3.a, 2.1, 2.3
3 Analyse concrete structures to determine the critical design actions (effects of design loads) on their structural elements in compliance with Australian Standards.	Creative and critical thinker	2, 2, 2.1.a, 2.1.a, 2.3.a, 2.1, 2.1, 2.3
4 Design concrete members and structures for durability (including fire resistance) and for ultimate and serviceability limit states compliantly to their relevant Australian Standards, guidelines and 'best' practice.	Empowered Ethical Sustainability-focussed	1, 1.3.a, 1.3.a, 1.3, 1.3, 2, 2.3.b, 2.3
5 Create design documentation outlining the outcomes of engineering design solutions to a professional standard and communicate the results of the design and its process in an interpretable manner.	Engaged	2, 2.1.a, 2.1, 3, 3.2.b, 3.1, 3.2
6 Collaborate with your Project team to design concrete structures (concept to optimised solutions), and produce and deliver a Design report and a Project presentation.	Creative and critical thinker Engaged	1, 1.3.a, 1.3, 2, 2, 2.1.f, 2.1.f, 2.1, 2.1

* Competencies by Professional Body

CODE	COMPETENCY
ENGINEERS AUSTRALIA STAGE 1 PROFESSIONAL ENGINEER COMPETENCY STANDARDS	
1.1.a	Knowledge and Skill Base - Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline: Engages with the engineering discipline at a phenomenological level, applying sciences and engineering fundamentals to systematic investigation, interpretation, analysis and innovative solution of complex problems and broader aspects of engineering practice.

CODE	COMPETENCY
1.3.a	Knowledge and Skill Base - In-depth understanding of specialist bodies of knowledge within the engineering discipline: Proficiently applies advanced technical knowledge and skills in at least one specialist practice domain of the engineering discipline.
1	Elements of competency: Knowledge and Skill Base
1.1	Knowledge and Skill Base: Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.
1.2	Knowledge and Skill Base: Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.
1.3	Knowledge and Skill Base: In-depth understanding of specialist bodies of knowledge within the engineering discipline.
2	Elements of competency: Engineering Application Ability
2.1.g	Engineering Application Ability - Application of established engineering methods to complex engineering problem solving: Critically reviews and applies relevant standards and codes of practice underpinning the engineering discipline and nominated specialisations.
2.3.a	Engineering Application Ability - Application of systematic engineering synthesis and design processes: Proficiently applies technical knowledge and open ended problem solving skills as well as appropriate tools and resources to design components, elements, systems, plant, facilities and/or processes to satisfy user requirements.
2.1.a	Engineering Application Ability - Application of established engineering methods to complex engineering problem solving: Identifies, discerns and characterises salient issues, determines and analyses causes and effects, justifies and applies appropriate simplifying assumptions, predicts performance and behaviour, synthesises solution strategies and develops substantiated conclusions.
2.3.b	Engineering Application Ability - Application of systematic engineering synthesis and design processes: Addresses broad contextual constraints such as social, cultural, environmental, commercial, legal political and human factors, as well as health, safety and sustainability imperatives as an integral part of the design process.
2.1.f	Engineering Application Ability - Application of established engineering methods to complex engineering problem solving: Conceptualises alternative engineering approaches and evaluates potential outcomes against appropriate criteria to justify an optimal solution choice.
2.1	Engineering Application Ability: Application of established engineering methods to complex engineering problem solving.
2.3	Engineering Application Ability: Application of systematic engineering synthesis and design processes.
3	Elements of competency: Professional and Personal Attributes
3.2.b	Professional and Personal Attributes - Effective oral and written communication in professional and lay domains: Prepares high quality engineering documents such as progress and project reports, reports of investigations and feasibility studies, proposals, specifications, design records, drawings, technical descriptions and presentations pertinent to the engineering discipline.
3.1	Professional and Personal Attributes: Ethical conduct and professional accountability.
3.2	Professional and Personal Attributes: Effective oral and written communication in professional and lay domains.
ENGINEERS AUSTRALIA STAGE 1 ENGINEERING TECHNOLOGIST COMPETENCY STANDARDS	
1	Elements of competency: Knowledge and Skill Base
1.3.a	Knowledge and Skill Base - In-depth understanding of specialist bodies of knowledge within the technology domain: Proficiently applies advanced technical knowledge and skills to deliver engineering outcomes in specialist area(s) of the technology domain and associated industry, commercial and community sectors.
1.3	Knowledge and Skill Base: In-depth understanding of specialist bodies of knowledge within the technology domain.
2	Elements of competency: Engineering Application Ability
2.1.a	Engineering Application Ability - Application of established engineering methods to broadly-defined problem solving within the technology domain: Identifies, discerns and characterises salient issues, determines and analyses causes and effects, justifies and applies appropriate simplifying assumptions, predicts performance and behaviour, synthesises solution strategies and develops substantiated conclusions.

CODE	COMPETENCY
2.1.f	Engineering Application Ability - Application of established engineering methods to broadly-defined problem solving within the technology domain: Critically evaluates alternative implementation approaches using specialist engineering technologies and evaluates potential outcomes against appropriate criteria to justify an optimal solution choice.
2.1	Engineering Application Ability: Application of established engineering methods to broadly-defined problem solving within the technology domain.

5. Am I eligible to enrol in this course?

Refer to the UniSC Glossary of terms for definitions of “pre-requisites, co-requisites and anti-requisites”.

5.1. Pre-requisites

CIV200

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

ENG451 and CIV451

5.4. Specific assumed prior knowledge and skills (where applicable)

Not applicable

5.5. Microcredential Information

Not applicable

6. How am I going to be assessed?

6.1. Grading Scale

Standard Grading (GRD)

High Distinction (HD), Distinction (DN), Credit (CR), Pass (PS), Fail (FL).

6.2. Details of early feedback on progress

Your engagement in weekly formative tutorial exercises will demonstrate your level of proficiency of the course material. You may peer-review the draft of your Tasks during the Tutorials.

6.3. Assessment tasks

DELIVERY MODE	TASK NO.	ASSESSMENT PRODUCT	INDIVIDUAL OR GROUP	WEIGHTING %	WHAT IS THE DURATION / LENGTH?	WHEN SHOULD I SUBMIT?	WHERE SHOULD I SUBMIT IT?
All	1	Written Piece	Individual	30%	Four short design reports of max. 250 words. Word limit excludes calculations, diagrams, sketches & Appendices.	Refer to Format	In Class
All	2	Oral and Written Piece	Group	30%	One design report of max. 1000 words and one project presentation of max. 15 minutes.	Week 12	Online Assignment Submission with plagiarism check
All	3	Examination - not Centrally Scheduled	Individual	40%	2 hours	Week 12	Online Assignment Submission with plagiarism check

All - Assessment Task 1: Written Piece

GOAL:	Develop and consolidate your skills to determine the relevant limit state conditions of structural concrete members, design these elements to their relevant limit states and Australian Standards, provide the detailing of these elements if applicable, and discuss the design procedures and/or your design.
PRODUCT:	Written Piece
AUTHORSHIP STATEMENT:	
FORMAT:	You submit your tasks at the start of your tutorial (in class) in Weeks 2, 4, 6 & 8.
CRITERIA:	

No.		Learning Outcome assessed
1	Demonstration of competencies in utilising Australian Standards, relevant design guidelines and design handbooks where they are appropriate and applicable ('best' practice).	2
2	Analysis and design of concrete beams, slabs and columns in practical context in compliance with Australian Standard, eg. AS3600.	3 4
3	Production of design documentation that includes calculations, drawings and detailings to a professional standard.	5
4	210 Description and explanation of design aspects and phenomena.	1

GENERIC SKILLS:	Communication, Problem solving

All - Assessment Task 2: Oral and Report

GOAL:	Advance and further your skills and competencies to analyse and design concrete structures compliantly to Australian Standards, relevant design guidelines and design handbooks where they are appropriate and applicable ('best' practice).
PRODUCT:	Oral and Written Piece
AUTHORSHIP STATEMENT:	
FORMAT:	Your group submit their report at the start of the tutorial and deliver their presentation during the tutorial in Week 12.
CRITERIA:	

No.		Learning Outcome assessed
1	Demonstration of competencies in utilising Australian Standards, relevant design guidelines and design handbooks where they are appropriate and applicable ('best' practice).	2
2	Use and application of methods and procedures to compliantly analyse and design concrete structures to limit states.	2 3 4
3	Description and explanation of design aspects and phenomena.	1
4	Production and delivery of a design report and presentation to professional engineering standard.	5
5	Functioning and collaborating in a project team when carrying out project tasks and producing project deliverables.	6

GENERIC SKILLS:	Communication, Problem solving, Organisation

All - Assessment Task 3: Examination

GOAL:	Demonstrate your skills and competencies to compliantly analyse and design structural concrete members to limit states, provide their detailing and/or discuss the design procedures and/or your design.
PRODUCT:	Examination - not Centrally Scheduled
AUTHORSHIP STATEMENT:	
FORMAT:	You complete Task 3 in class, during your Tutorial, in Week 12.
CRITERIA:	

No.		Learning Outcome assessed
1	Demonstration of competencies in utilising Australian Standards, relevant design guidelines and design handbooks where they are appropriate and applicable ('best' practice).	2
2	Use and application of methods and procedures to analyse and design concrete members compliantly to Australian Standard, eg. AS3600 with presentation of complete workings that include e.g. calculations, drawings and detailings.	3 4 5
3	Description and explanation of design aspects and phenomena.	1

GENERIC SKILLS:	Communication, Problem solving

7. Directed study hours

A 12-unit course will have total of 150 learning hours which will include directed study hours (including online if required), self-directed learning and completion of assessable tasks. Student workload is calculated at 12.5 learning hours per one unit.

8. What resources do I need to undertake this course?

Please note: Course information, including specific information of recommended readings, learning activities, resources, weekly readings, etc. are available on the course Canvas site– Please log in as soon as possible.

8.1. Prescribed text(s) or course reader

You need regular access to the resource(s) below. Many texts are available as ebooks through the Library at no additional cost.

REQUIRED?	AUTHOR	YEAR	TITLE	EDITION	PUBLISHER
Recommended	Yew-Chaye Loo,Sanaul Huq Chowdhury	2018	Reinforced and Prestressed Concrete	3rd edition	Cambridge University Press

8.2. Specific requirements

Nil

9. How are risks managed in this course?

Health and safety risks for this course have been assessed as low. It is your responsibility to review course material, search online, discuss with lecturers and peers and understand the health and safety risks associated with your specific course of study and to familiarise yourself with the University's general health and safety principles by reviewing the online induction training for students, and following the instructions of the University staff.

10. What administrative information is relevant to this course?

10.1. Assessment: Academic Integrity

Academic integrity is the ethical standard of university participation. It ensures that students graduate as a result of proving they are competent in their discipline. This is integral in maintaining the value of academic qualifications. Each industry has expectations and standards of the skills and knowledge within that discipline and these are reflected in assessment.

Academic integrity means that you do not engage in any activity that is considered to be academic fraud; including plagiarism, collusion or outsourcing any part of any assessment item to any other person. You are expected to be honest and ethical by completing all work yourself and indicating in your work which ideas and information were developed by you and which were taken from others. You cannot provide your assessment work to others. You are also expected to provide evidence of wide and critical reading, usually by using appropriate academic references.

In order to minimise incidents of academic fraud, this course may require that some of its assessment tasks, when submitted to Canvas, are electronically checked through Turnitin. This software allows for text comparisons to be made between your submitted assessment item and all other work to which Turnitin has access.

10.2. Assessment: Additional Requirements

Eligibility for Supplementary Assessment

Your eligibility for supplementary assessment in a course is dependent of the following conditions applying:
(a) The final mark is in the percentage range 47% to 49.4%; and
(b) The course is graded using the Standard Grading scale

10.3. Assessment: Submission penalties

Late submissions may be penalised up to and including the following maximum percentage of the assessment task's identified value, with weekdays and weekends included in the calculation of days late:
(a) One day: deduct 5%;
(b) Two days: deduct 10%;
(c) Three days: deduct 20%;
(d) Four days: deduct 40%;
(e) Five days: deduct 60%;
(f) Six days: deduct 80%;
(g) Seven days: A result of zero is awarded for the assessment task.

The following penalties will apply for a late submission for an online examination:
Less than 15 minutes: No penalty
From 15 minutes to 30 minutes: 20% penalty
More than 30 minutes: 100% penalty

10.4. Links to relevant University policy and procedures

For more information on Academic Learning & Teaching categories including:

- Assessment: Courses and Coursework Programs
- Review of Assessment and Final Grades
- Supplementary Assessment
- Central Examinations
- Deferred Examinations
- Student Conduct
- Students with a Disability

For more information, visit https://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching

10.5. Student Charter

UniSC is committed to excellence in teaching, research and engagement in an environment that is inclusive, inspiring, safe and respectful. The Student Charter sets out what students can expect from the University, and what in turn is expected of students, to achieve these outcomes.

10.6. General Enquiries

For course-specific questions, contact your teaching staff or Course Coordinator.

For other enquiries or to access support, please contact Student Central:

- UniSC Student Central
- UniSC Adelaide Student Central