

CIV300 Structural Design

School: School of Science, Technology and Engineering

2026 | Trimester 1

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 timber and steel structures and infrastructures that meet regulatory standards. This course focuses on the design philosophy outlined in the Australian Standards. You will acquire the necessary skills to design timber and steel structures, including their members and connections, while considering limit states. The course also covers the detailing of connections for these structures in compliance with Australian Standards AS 1720.1 and AS 4100.

1.2. How will this course be delivered?

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

1.3. Course Topics

Topics may include:

- Introduction to Timber Structures, including materials, durability, and Engineered Wood Products (EWPs)
- Design of Timber Structures according to AS1170, encompassing the design of timber members and connections to limit state
- Introduction to Steel Materials and Structures
- Design of Steel Members and Connections to limit states according to AS4100

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 Use and apply design codes e.g. AS 1720.1 and AS 4100; determine design loads and load combinations for strength and serviceability and understand their importance in limit state design.	Knowledgeable Ethical	2, 2, 2.1.g, 2.1.g, 2.1, 2.1
2 Analyse structures or structural members to determine the design actions developing in response to the design load combinations and arrangements.	Empowered Ethical	2, 2, 2.3.a, 2.3.a, 2.3, 2.3
3 Design structures and structural elements in timber and steel for to relevant limit states, e.g. strength, stability and serviceability, compliantly to their relevant Australian Standards, guidelines and 'best' practices.	Empowered Ethical Sustainability-focused	2, 2, 2.3.b, 2.3.b, 2.3, 2.3
4 Create design documentation outlining the outcomes of engineering design solutions to a professional standard to and communicate, by graphical means, the results of the design process in an interpretable manner.	Engaged	3, 3, 3.2.b, 3.2.b, 3.1, 3.1, 3.2, 3.2
5 Collaborate with your Project team to design timber and steel structures (concept to optimised solutions), and produce and deliver a Design report and a Project presentation.	Creative and critical thinker Engaged	1, 1, 1.3.a, 1.3.a, 1.3, 1.3

* Competencies by Professional Body

CODE	COMPETENCY
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.g	Engineering Application Ability - Application of established engineering methods to broadly-defined problem solving within the technology domain: Interprets, applies and verifies compliance with relevant standards and codes of practice as well as legislative and statutory requirements underpinning specialist practice area(s) of the technology domain.
2.3.a	Engineering Application Ability - Application of systematic synthesis and design processes within the technology domain: Proficiently applies technological knowledge and problem solving skills as well as established tools and procedures to design components, system elements, plant, facilities and/or processes to meet technical specifications and performance criteria.
2.3.b	Engineering Application Ability - Application of systematic synthesis and design processes within the technology domain: Accommodates contextual factors that impact the technology domain, and in particular to ensure that health, safety and sustainability imperatives are addressed as an integral part of the design process.
2.1	Engineering Application Ability: Application of established engineering methods to broadly-defined problem solving within the technology domain.

CODE	COMPETENCY
2.3	Engineering Application Ability: Application of systematic synthesis and design processes within the technology domain.
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 technology domain.
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 PROFESSIONAL ENGINEER 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 engineering discipline: Proficiently applies advanced technical knowledge and skills in at least one specialist practice domain of 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.
2.3.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	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.

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

(CV200 and enrolled in SC410) OR (MEC221 and enrolled in SC404, SC405, SC411 or SC425)

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

ENG212

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	Individual	30%	1000-words report and 5-minutes presentation	Week 12	Online Assignment Submission with plagiarism check
All	3	Examination - not Centrally Scheduled	Individual	40%	2 hours	Week 12	In Class

All - Assessment Task 1: Written Piece

GOAL:	Determine the relevant limit state conditions of structural timber and steel elements, 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:	Submission: Weeks 2, 4, 6 & 8 You determine the relevant limit state conditions of structural timber and steel elements, 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.	
CRITERIA:	No.	Learning Outcome assessed
	1	Demonstration of competence in utilising Australian Standards, relevant design guidelines and design handbooks where they are appropriate and applicable. 1
	2	Design of simple timber beams and columns within the context of practical applications, in accordance with AS1720 Timber Structures and presentation of the computations and drawings to a professional standard 2
GENERIC SKILLS:	Organisation, Applying technologies, Information literacy	

All - Assessment Task 2: Oral and Written Report

GOAL:	Advance your skill and competencies, working towards meeting your Engineers Australia competencies.	
PRODUCT:	Oral and Written Piece	
AUTHORSHIP STATEMENT:		
FORMAT:	The Design project will allow you to advance your skill and competencies, working towards meeting your Engineers Australia competencies. You will demonstrate your (structural) design abilities by developing, designing and drawing the structure of a building, and will contribute to further developing and/or improving your collaboration skills.	
CRITERIA:	No.	Learning Outcome assessed
	1	Demonstration of competence in utilising Australian Standards, relevant design guidelines and design handbooks where they are appropriate and applicable. 1
	2	Design of simple timber beams and columns within the context of practical applications, in accordance with AS1720 Timber Structures and presentation of the computations and drawings to a professional standard 2
	3	Proposal of structural designs for steel beams and columns in accordance with AS4100 with regard to various requirements such as safety, economy and durability 3
	4	Creation of a report outlining the outcomes of engineering design computations to a professional standard and communication, by graphical means, of the results of the design process. 4
	5	Appraisal of the principles of strength limit state design used in the design of steel beams, columns, reinforced concrete beams and slabs and identification of the types of failures possible in steel and reinforced concrete structural elements. 5
GENERIC SKILLS:	Communication, Collaboration, Organisation, Applying technologies	

All - Assessment Task 3: Examination

GOAL:	Demonstrate your understanding and ability to apply methods of structural analysis and design.																
PRODUCT:	Examination - not Centrally Scheduled																
AUTHORSHIP STATEMENT:																	
FORMAT:	The final exam assesses the material (learning material, tutorials and assignments) covered in the course and the self-study material. You will be required to analyse structures and design steel and timber members. With your solutions you will demonstrate your understanding and ability to apply methods of structural analysis and design.																
CRITERIA:	<table border="1"> <thead> <tr> <th>No.</th> <th></th> <th>Learning Outcome assessed</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Demonstration of competence in utilising Australian Standards, relevant design guidelines and design handbooks where they are appropriate and applicable.</td> <td>1</td> </tr> <tr> <td>2</td> <td>Design of simple timber beams and columns within the context of practical applications, in accordance with AS1720 Timber Structures and presentation of the computations and drawings to a professional standard</td> <td>2</td> </tr> <tr> <td>3</td> <td>Proposal of structural designs for steel beams and columns in accordance with AS4100 with regard to various requirements such as safety, economy and durability</td> <td>3</td> </tr> <tr> <td>4</td> <td>Appraisal of the principles of strength limit state design used in the design of steel beams, columns, reinforced concrete beams and slabs and identification of the types of failures possible in steel and reinforced concrete structural elements.</td> <td>5</td> </tr> </tbody> </table>	No.		Learning Outcome assessed	1	Demonstration of competence in utilising Australian Standards, relevant design guidelines and design handbooks where they are appropriate and applicable.	1	2	Design of simple timber beams and columns within the context of practical applications, in accordance with AS1720 Timber Structures and presentation of the computations and drawings to a professional standard	2	3	Proposal of structural designs for steel beams and columns in accordance with AS4100 with regard to various requirements such as safety, economy and durability	3	4	Appraisal of the principles of strength limit state design used in the design of steel beams, columns, reinforced concrete beams and slabs and identification of the types of failures possible in steel and reinforced concrete structural elements.	5	
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GENERIC SKILLS:	Problem solving, Organisation, Applying technologies																

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	AS/NZS	0	AS/NZS 1170.0 Structural design actions - General principles	n/a	n/a
Recommended	AS/NZS	0	AS/NZS 1170.1 Structural design actions - Permanent, imposed and other actions	n/a	n/a
Recommended	AS/NZS	0	AS/NZS 1170.2 Structural design actions - Wind actions	n/a	n/a
Recommended	AS/NZS	0	AS 1720.1 Timber structures, Part 1: Design methods.AS 1720.1	n/a	n/a
Recommended	AS/NZS	0	AS 4100 Steel structures	n/a	n/a
Recommended	Kirke, B. and Al-Jamel, I. H.	2004	Steel Structures Design Manual to AS 4100	1st	n/a

8.2. Specific requirements

Not applicable

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

Your eligibility for supplementary assessment in a course is dependent of the following conditions applying: The final mark is in the percentage range 47% to 49.4% The course is graded using the Standard Grading scale You have not failed an assessment task in the course due to academic misconduct

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](#)