COURSE OUTLINE

CIV404 Engineering Sustainable Design

School: School of Science, Technology and Engineering

2026 | Semester 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

In this course you will learn about the role of whole-system engineering design to achieve sustainable outcomes in building projects. You will become familiar with ratings and assessment methods, which consider the social, environmental and economic impacts of a building project. You will explore best-practice sustainable design principles, and learn about modelling building performance. You will also increase your understanding of different construction materials, and their role in promoting sustainable and healthy buildings.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Learning materials – Asynchronous Learning Material	1hr	Week 1	13 times
Tutorial/Workshop 1 – Online Workshop	1hr	Week 1	13 times
Tutorial/Workshop 2 – On campus tutorial	2hrs	Week 1	13 times

1.3. Course Topics

The built environment and its impacts

Overview of sustainable buildings

Environmental and economic assessment methods

Regulations and incentives

Green building rating tools

Conventional versus integrative design

Green Star

Site analysis

Building hydrological cycle

Climate and building physics

Energy and atmosphere: passive design

Energy and atmosphere: glazing and active systems

Building Information Modelling (BIM) overview

Introduction to Building Performance Modelling (BPM)

Sustainable materials and products

Indoor environment quality

Post occupancy evaluation

Construction and commissioning

2. What level is this course?

400 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...	Engineers Australia Stage 1 Professional Engineer Competency Standards
1 Adopt a whole systems design cycle approach to evaluate and develop appropriate sustainable engineering solutions.	Sustainability-focussed	1.1, 2.1, 2.2
2 Demonstrate and apply knowledge of fundamental sustainable design principles	Knowledgeable	1.1, 2.1, 2.2
3 Apply assessment techniques and tools to quantify the sustainable performance of materials and projects	Sustainability-focussed	1.1, 2.1, 2.2
4 Understand and determine the environmental impacts of various phases of a building project.	Sustainability-focussed	2.1, 2.2, 3.1, 3.2, 3.5

* Competencies by Professional Body

CODE	COMPETENCY
ENGINEERS AUSTRALIA STAGE 1 PROFESSIONAL ENGINEER COMPETENCY STANDARDS	
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.
2.1	Engineering Application Ability: Application of established engineering methods to complex engineering problem solving.
2.2	Engineering Application Ability: Fluent application of engineering techniques, tools and resources.
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.
3.5	Professional and Personal Attributes: Orderly management of self, and professional conduct.

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

ENG202 or ENG104 and enrolled in SC410, SC425, SC411, SC404, SC405

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

ENG404

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

In week 2, the draft copy of your Assessment report will be peer reviewed in your workshop.

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	Report	Individual	20%	1,500 words	Week 3	Online Assignment Submission with plagiarism check
All	2a	Quiz/zes	Individual	20%	40 Mins	Week 5	In Class
All	2b	Quiz/zes	Individual	20%	40 Mins	Week 10	In Class
All	3a	Report	Group	30%	2,000 to 2,500 words per person	Week 13	Online Assignment Submission with plagiarism check
All	3b	Oral	Group	10%	15 mins + question time	Week 13	In Class

All - Assessment Task 1: Assessment report

GOAL:	This task has been designed to develop your professional communication skills and your ability to assess the environmental and economic impacts of buildings.
PRODUCT:	Report
AUTHORSHIP STATEMENT:	
FORMAT:	You are to write a 1,500-word individual report that elaborates on tutorial discussions regarding methods to assess the environmental and economic performance of buildings. Your report should focus on two such methods, and discuss the following for each: Description of the method, including relevant definitions, calculations and tools Review of its development Benefits and limitations Efforts to achieve industry standardisation A case study which applies the method to a building, building system or construction material. The report should be in doc or docx format and use the Harvard referencing style. Submission is via Canvas (Turnitin).
CRITERIA:	

No.		Learning Outcome assessed
1	Clarity of explanation	2 4
2	Evidence of research and relevance of information	2
3	Use of reliable references, and appropriate referencing	3
4	Appropriate use of diagrams, tables and graphs (if applicable)	1 3

GENERIC SKILLS:	

All - Assessment Task 2a: Quiz 1

GOAL:	You will demonstrate your understanding of the fundamental concepts of sustainable building design.
PRODUCT:	Quiz/zes
AUTHORSHIP STATEMENT:	
FORMAT:	Multiple choice and short answer questions. Individual submission, to be completed in class. The quizzes are an opportunity to demonstrate your understanding and application of the concepts reviewed in the learning materials and discussed during the tutorials. Programmable calculators are NOT permitted but scientific ones are. The use of other electronic devices, such as mobile phones and tablets, is not permitted
CRITERIA:	

No.		Learning Outcome assessed
1	Ability to analyse information	2
2	Knowledge of the theoretical and practical components of course material	1 3
3	Demonstrated understanding of whole-system engineering design	4

GENERIC SKILLS:	

All - Assessment Task 2b: Quiz 2

GOAL:	You will demonstrate your understanding of the fundamental concepts of sustainable building design.
PRODUCT:	Quiz/zes
AUTHORSHIP STATEMENT:	
FORMAT:	Multiple choice and short answer questions. Individual submission, to be completed in class. The quizzes are an opportunity to demonstrate your understanding and application of the concepts reviewed in the learning material and discussed during the tutorials. Programmable calculators are NOT permitted but scientific ones are. The use of other electronic devices, such as mobile phones and tablets, is not permitted
CRITERIA:	

No.		Learning Outcome assessed
1	Ability to analyse information	3
2	Knowledge of the theoretical and practical components of course material	1 3
3	Demonstrated understanding of whole-system engineering design	4

GENERIC SKILLS:	

All - Assessment Task 3a: ESD Report

GOAL:	This is a professionally based task that will enable you to both develop advanced collaboration skills but also to demonstrate your knowledge in applying and evaluating a building project.You will develop the skills to apply a recognised sustainability rating system and assess the project's potential to achieve certification. Ultimately you will produce a written report at industry standard.
PRODUCT:	Report
AUTHORSHIP STATEMENT:	
FORMAT:	Your group (4 students max) is asked to imagine that you are ESD consultants hired by a local developer to recommend sustainable design strategies for one of their building projects. You will receive information on the development site, and will be required to produce an ESD report, which contains the following: Site analysis. Consider local planning issues, ecology, the potential for flooding, nearby amenities, transport, and climate data. Use diagrams, sketches, and maps to illustrate your findings, where appropriate. A concept design for the building(s). Incorporate findings from your site analysis, and also consider the following: building orientation and form; passive heating and cooling strategies; natural daylighting; any required active systems. Use Climate Consultant to determine the achievable thermal comfort level for the building(s). Water sensitive urban design (WSUD) concept for the development. Consider a suitable stormwater measure, where you might locate it, and its approximate size. Potential Green Star Rating. Prepare advice on the potential to achieve a Green Star - Design and As-Built rating certification from the Green Building Council of Australia. The main body report should be 2,000 to 2,500 words per person in the group. Where appropriate, it should contain diagrams, sketches, calculations and tables. Further information on the report content and structure will be available on Canvas. As part of your group work, you will also actively participate in a peer assessment review process, and provide feedback on group member contributions.
CRITERIA:	
GENERIC SKILLS:	

No.		Learning Outcome assessed
1	Level of research undertaken to understand the site conditions	2
2	Appropriateness of the sustainable design strategies being proposed	1 3
3	Clear articulation of the Green Star compliance requirements and methods used to demonstrate compliance.	2 3
4	Professional written communication skills, including appropriate use of visual aids.	2
5	Professional and ethical conduct collaborating with peers	2

All - Assessment Task 3b: Oral Presentation

GOAL:	Making oral presentations to clients, community and industry is a staple competency for engineering and requires planning, organisation and practice.This presentation will develop and allow you to demonstrate your professional presentation skills.You will pitch this presentation to a potential client.
PRODUCT:	Oral
AUTHORSHIP STATEMENT:	
FORMAT:	Your group of ESD consultants are required to present the findings of your report, including the potential GBCA rating to the client. The presentation should be no more than 15 minutes.
CRITERIA:	

No.		Learning Outcome assessed
1	Overview of research and findings	2
2	Recommendations to the client for certification	4
3	Professional communication materials: PowerPoint slides, and use of diagram, tables, and handouts - where appropriate.	4
4	Professional communication: oral communication skills	4
5	Professional and ethical conduct collaborating with peers	4

GENERIC SKILLS:	

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
Required	Green Building Council of Australia	2014	Green Star Design & As Built v1: Submission Guidelines		Green Building Council of Australia

8.2. Specific requirements

N/A

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: 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 submission of assessment tasks may be penalised at the following maximum rate: - 5% (of the assessment task's identified value) per day for the first two days from the date identified as the due date for the assessment task. - 10% (of the assessment task's identified value) for the third day - 20% (of the assessment task's identified value) for the fourth day and subsequent days up to and including seven days from the date identified as the due date for the assessment task. - A result of zero is awarded for an assessment task submitted after seven days from the date identified as the due date for the assessment task. Weekdays and weekends are included in the calculation of days late. To request an extension you must contact your course coordinator to negotiate an outcome.

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

In person:

- **UniSC Sunshine Coast** - Student Central, Ground Floor, Building C, 90 Sippy Downs Drive, Sippy Downs
- **UniSC Moreton Bay** - Service Centre, Ground Floor, Foundation Building, Gympie Road, Petrie
- **UniSC SouthBank** - Student Central, Building A4 (SW1), 52 Merivale Street, South Brisbane
- **UniSC Gympie** - Student Central, 71 Cartwright Road, Gympie
- **UniSC Fraser Coast** - Student Central, Student Central, Building A, 161 Old Maryborough Rd, Hervey Bay
- **UniSC Caboolture** - Student Central, Level 1 Building J, Cnr Manley and Tallon Street, Caboolture

Tel: +61 7 5430 2890

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