COURSE OUTLINE

ENG206 Sustainable Engineering (Design)

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

Within all branches of engineering a practising engineer needs to be able to develop designs to solve problems and develop new products. Following the introductory courses in the first year this course will build upon the students knowledge of the design process and sustainability and further their knowledge of the use of design through a multidisciplinary group project based approach. For students completing an engineering technologist award the emphasis of the group work will be on facilitating a greater understanding of the practical responsibilities of the role.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Learning materials – Asynchronous weekly learning material	1hr	Week 1	12 times
Tutorial/Workshop 1 – On campus	2hrs	Week 1	12 times
Laboratory 1 – On campus	2hrs	Week 2	3 times
Seminar – On campus seminar	1hr	Week 6	2 times

1.3. Course Topics

Topics may include:

- Design specifications & concept selection methods
- Ethics, systems, sustainability, standards, patents & standards marking
- Topics relevant to the individual engineering discipline that will be embedded in the multidisciplinary project

2. What level is this course?

200 Level (Developing)

Building on and expanding the scope of introductory knowledge and skills, developing breadth or depth and applying knowledge and skills in a new context. May require pre-requisites where discipline specific introductory knowledge or skills is necessary. Normally, undertaken in the second or third full-time year of an undergraduate programs.

3. What is the unit value of this course?

12 units

4. How does this course contribute to my learning?

COURSE LEARNING OUTCOMES On successful completion of this course, you should be able to...	GRADUATE QUALITIES MAPPING Completing these tasks successfully will contribute to you becoming...	PROFESSIONAL STANDARD MAPPING * Competencies from multiple Professional Bodies (see below) *
1 Recognise the multidisciplinary approaches to engineering design.	Knowledgeable	1, 1, 1.4.a, 1.4.a, 1.4, 1.4
2 Select the appropriate tools for a design problem.	Knowledgeable	1, 1, 1.1.a, 1.1.a, 1.1, 1.1
3 Analyse and evaluate an engineering design, within the context of its capabilities and limitations, to address critical issues in an engineering case study.	Creative and critical thinker	2, 2, 2.1.b, 2.1.b, 2.1, 2.1
4 Develop an engineering project within the context of a case study, integrating various elements of a comprehensive engineering design and knowledge of the role of the professional engineer and technologist.	Empowered	2, 2, 2.3.a, 2.3.a, 2.4.d, 2.4.d, 2.3, 2.3, 2.4, 2.4
5 Investigate and evaluate the importance of sustainability in design.	Sustainability-focussed	1, 1, 1.6.c, 1.6.e, 1.6, 1.6
6 Categorise the stages of design where sustainability issues are relevant.	Sustainability-focussed	1, 1, 1.6.d, 1.6.d, 1.6, 1.6

* Competencies by Professional Body

CODE	COMPETENCY
ENGINEERS AUSTRALIA STAGE 1 ENGINEERING TECHNOLOGIST COMPETENCY STANDARDS	
1	Elements of competency: Knowledge and Skill Base
1.4.a	Knowledge and Skill Base - Discernment of knowledge development within the technology domain: Identifies and critically appraises current developments and emerging issues professionally disseminated in specialist practice area(s) of the technology domain.
1.1.a	Knowledge and Skill Base - Systematic, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the technology domain: Engages with the technology domain at a phenomenological level, applying sciences and engineering fundamentals to systematic investigation, interpretation, analysis and innovative solution of broadly-defined problems and engineering technology practice.
1.6.c	Knowledge and Skill Base - Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the technology domain: Appreciates the social, environmental and economic principles of sustainable engineering practice.
1.6.d	Knowledge and Skill Base - Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the technology domain: Understands the fundamental principles of engineering project management and systems as a basis for planning, organising and managing resources.
1.1	Knowledge and Skill Base: Systematic, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the technology domain.
1.4	Knowledge and Skill Base: Discernment of knowledge development within the technology domain.
1.6	Knowledge and Skill Base: Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the technology domain.

CODE	COMPETENCY
2	Elements of competency: Engineering Application Ability
2.1.b	Engineering Application Ability - Application of established engineering methods to broadly-defined problem solving within the technology domain: Ensures that the application of specialist technologies are soundly based on fundamental principles by diagnosing, and taking appropriate action with data, calculations, results, proposals, processes, practices, and documented information that may be ill-founded, illogical, erroneous, unreliable or unrealistic.
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.
2.4.d	Engineering Application Ability - Application of systematic approaches to the conduct and management of projects within the technology domain: Proficiently applies basic systems engineering and/or project management tools and processes to the planning and execution of project work, targeting the delivery of a significant outcome to a professional standard.
2.1	Engineering Application Ability: Application of established engineering methods to broadly-defined problem solving within the technology domain.
2.3	Engineering Application Ability: Application of systematic synthesis and design processes within the technology domain.
2.4	Engineering Application Ability: Application of systematic approaches to the conduct and management of projects within the technology domain.
ENGINEERS AUSTRALIA STAGE 1 PROFESSIONAL ENGINEER COMPETENCY STANDARDS	
1	Elements of competency: Knowledge and Skill Base
1.4.a	Knowledge and Skill Base - Discernment of knowledge development and research directions within the engineering discipline: Identifies and critically appraises current developments, advanced technologies, emerging issues and interdisciplinary linkages in at least one specialist practice domain of the engineering discipline.
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.
1.6.e	Knowledge and Skill Base - Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline: Appreciates the formal structures and methodologies of systems engineering as a holistic basis for managing complexity and sustainability in engineering practice.
1.6.d	Knowledge and Skill Base - Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline: Understands the fundamental principles of engineering project management as a basis for planning, organising and managing resources.
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.
1.4	Knowledge and Skill Base: Discernment of knowledge development and research directions within the engineering discipline.
1.6	Knowledge and Skill Base: Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline.
2	Elements of competency: Engineering Application Ability
2.1.b	Engineering Application Ability - Application of established engineering methods to complex engineering problem solving: Ensures that all aspects of an engineering activity are soundly based on fundamental principles - by diagnosing, and taking appropriate action with data, calculations, results, proposals, processes, practices, and documented information that may be ill-founded, illogical, erroneous, unreliable or unrealistic.
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.
2.4.d	Engineering Application Ability - Application of systematic approaches to the conduct and management of engineering projects: Proficiently applies basic systems engineering and/or project management tools and processes to the planning and execution of project work, targeting the delivery of a significant outcome to a professional standard.

CODE	COMPETENCY
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.
2.4	Engineering Application Ability: Application of systematic approaches to the conduct and management of engineering projects.

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

ENG104

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

Not applicable

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

Early feedback will be provided through completion of weekly activities in workshops. Furthermore, feedback on each assessment will be provided which will be used to help with the following assessment.

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	Quiz/zes	Individual	40%	20 minutes each	Refer to Format	Online Test (Quiz)
All	2	Artefact - Technical and Scientific	Group	15%	One A1-size poster.	Week 7	Online Submission
All	3	Oral and Written Piece	Group	45%	8 minutes oral presentation approx 3500 word report	Refer to Format	Online Assignment Submission with plagiarism check and in class

All - Assessment Task 1: Competency Quiz

GOAL:	Assess competency in subject matter.
PRODUCT:	Quiz/zes
AUTHORSHIP STATEMENT:	
FORMAT:	Two online quizzes with mix of question styles. Held during Week 4 and Week 10.

CRITERIA:

No.		Learning Outcome assessed
1	Recognition of multidisciplinary approaches to engineering design.	1
2	Selection of appropriate tools for a design problem.	2
3	Analysis and evaluation of an engineering design, within the context of its capabilities and limitations.	3
4	Integration of the various elements of a comprehensive engineering design and knowledge of the role of the professional engineer and technologist.	4
5	Investigation and evaluation of the importance of sustainability in design.	5
6	Categorisation of the stages of design where sustainability issues are relevant.	6

GENERIC SKILLS:	Problem solving, Organisation, Applying technologies

All - Assessment Task 2: Poster

GOAL:	Communicate the work to be undertaken in the group project.
PRODUCT:	Artefact - Technical and Scientific
AUTHORSHIP STATEMENT:	
FORMAT:	Group presentation of the work to be undertaken in the group project, in form of a poster.

CRITERIA:

No.		Learning Outcome assessed
1	Development of an engineering project within the context of a case study, integrating various elements of a comprehensive engineering design and knowledge of the role of the professional engineer and technologist.	4
2	Investigation and evaluation of the importance of sustainability in design.	5
3	Categorisation of the stages of design where sustainability issues are relevant.	6
4	Critically evaluate a product, to address critical sustainability issues in an engineering case study.	3

GENERIC SKILLS:	Communication, Collaboration, Organisation, Applying technologies, Information literacy

All - Assessment Task 3: Group design project

GOAL:	Collaborate as a group on an engineering design solution and communicate the work completed in the group project.
PRODUCT:	Oral and Written Piece
AUTHORSHIP STATEMENT:	
FORMAT:	Live group oral presentation with supporting visual aids and report submitted online. Submissions due week 11-12.

CRITERIA:

No.		Learning Outcome assessed
1	Recognition of the multidisciplinary approaches to engineering design.	1
2	Selection of the appropriate tools for a design problem.	2
3	Analysis and evaluation of an engineering design, within the context of its capabilities and limitations, to address critical issues in an engineering case study.	3
4	Development of an engineering project within the context of a case study, integrating various elements of a comprehensive engineering design and knowledge of the role of the professional engineer and technologist.	4
5	Investigation and evaluation of the importance of sustainability in design.	5
6	Categorisation of the stages of design where sustainability issues are relevant.	6

GENERIC SKILLS:	Communication, Collaboration, Problem solving, Organisation, Applying technologies, Information literacy

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

There are no required/recommended resources for this course.

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

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 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