

CIV401 Sustainable Transport Systems

School: School of Science, Technology and Engineering

2025 | Semester 1

UniSC Sunshine Coast
UniSC Moreton Bay

**BLENDED
LEARNING**

You can do this course without coming onto campus, unless your program has specified a mandatory onsite requirement.

Please go to usc.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

This course has been designed to help you develop creative and critical thinking skills through the lens of sustainable transport systems. It will focus on developing your skills at the graduate level, specifically having you take a sustainable focus and explore evolving technologies that are poised to radically change our transport systems.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Learning materials – Weekly learning material	2hrs	Week 1	13 times
Tutorial/Workshop 1 – Workshop related to learning materials (on campus)	2hrs	Week 1	13 times

1.3. Course Topics

Topics may include:

- Demand and supply transport concepts, including subscription models (e.g Mobility as a Service – MAAS), first and last mile concepts.
- Modern transport planning based on scenario-based modelling and big data analytics.
- Towards a more sustainable transport solution – greenhouse gas footprints of traditional versus innovative approaches and the performance of sustainable pavements
- Transition towards alternative fuel sources
- Psychological aspects of changing transport behaviours, particularly nudge theory

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 Critically analyze the development of alternative transport options considering changing resource availability and other external shocks and stresses (e. g. natural hazards, conflicts) that place different demands on infrastructure.	Creative and critical thinker	2, 2.1.a, 2.1
2 Analyse large datasets to provide sustainable solutions considering the increasing complexity of transport systems.	Creative and critical thinker	2, 2.1.a, 2.1
3 Apply principles of sustainable engineering to design and optimize transportation systems and propose innovative solutions that minimize environmental impact and enhance energy efficiency.	Empowered	2, 2.3.b, 2.3
4 Investigate and explore innovative techniques to progress towards a world with fossil free transport systems.	Sustainability-focussed	1, 1.4.a, 1.6.c, 1.4, 1.6
5 Evaluate the sustainability of different transport systems in meeting the needs of civil society.	Sustainability-focussed	1, 1.6.c, 1.6

* Competencies by Professional Body

CODE	COMPETENCY
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.
1.6.c	Knowledge and Skill Base - Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline: Appreciates the social, environmental and economic principles of sustainable engineering practice.
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.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.

CODE	COMPETENCY
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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.
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2.1	Engineering Application Ability: Application of established engineering methods to complex engineering problem solving.
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2.3	Engineering Application Ability: Application of systematic engineering synthesis and design processes.
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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

Enrolled in GC002, GD002, MC002, GC006, GD006, MC006, SC410 or SC425

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

Not applicable

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

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 3 a draft copy of the outline of the first assignment will be reviewed in the 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	Written Piece	Individual	25%	2000 words	Week 7	Online Assignment Submission with plagiarism check
All	2	Oral	Individual and Group	25%	15-20 min	Week 10	Online Assignment Submission with plagiarism check
All	3	Report	Group	50%	4000 words	Week 13	Online Assignment Submission with plagiarism check

All - Assessment Task 1: Sustainable Transport System Project Plan

GOAL:	Develop a project plan draft report.		
PRODUCT:	Written Piece		
FORMAT:	Intermediate individual development of a project plan focusing upon a Sustainable Transport Systems engineering task. This will be presented as a draft report mid way through the study period and be built upon for assessment tasks 2 and 3, within your assigned group.		
CRITERIA:	No.		Learning Outcome assessed
	1	Critical analysis of the development of alternative transport options considering changing resource availability and other external shocks and stresses (e. g. natural hazards, conflicts) that place different demands on infrastructure.	1
	2	Analysis of large datasets to provide sustainable solutions considering the increasing complexity of transport systems.	2
	3	Application of principles of sustainable engineering to design and optimise transportation systems and proposal of innovative solutions that minimise environmental impact and enhance energy efficiency.	3
GENERIC SKILLS:	Communication, Problem solving, Organisation, Information literacy		

All - Assessment Task 2: Oral Presentation

GOAL:	Team-based development of a project plan as a group (approx 3-4 students per group), building from assessment 1.		
PRODUCT:	Oral		
FORMAT:	Group oral presentation, with each member presenting and assessed individually. Students will work as a group, but assessed individually. Each group member to talk for about 5 mins totalling approx 15-20 minutes (depending on group size)		
CRITERIA:	No.		Learning Outcome assessed
	1	Critical analysis of the development of alternative transport options considering changing resource availability and other external shocks and stresses (e. g. natural hazards, conflicts) that place different demands on infrastructure.	1
	2	Analysis of large datasets to provide sustainable solutions considering the increasing complexity of transport systems.	2
	3	Application of principles of sustainable engineering to design and optimise transportation systems and proposal of innovative solutions that minimise environmental impact and enhance energy efficiency.	3
	4	Investigation and exploration of innovative techniques to progress towards a world with fossil free transport systems.	4
	5	Evaluation of the sustainability of different transport systems in meeting the needs of civil society.	5
GENERIC SKILLS:	Communication, Collaboration, Problem solving, Organisation, Information literacy		

All - Assessment Task 3: Report

GOAL:	Group report demonstrating development of your project from Task 1 and 2 and present your findings and recommendations in a report.	
PRODUCT:	Report	
FORMAT:	Group report demonstrating development of and solutions to Sustainable Transport Systems engineering task.	
CRITERIA:	No.	Learning Outcome assessed
	1	Critical analysis of the development of alternative transport options considering changing resource availability and other external shocks and stresses (e. g. natural hazards, conflicts) that place different demands on infrastructure. 1
	2	Analysis of large datasets to provide sustainable solutions considering the increasing complexity of transport systems. 2
	3	Application of principles of sustainable engineering to design and optimise transportation systems and proposal of innovative solutions that minimise environmental impact and enhance energy efficiency. 3
	4	Investigation and exploration of innovative techniques to progress towards a world with fossil free transport systems 5
	5	Evaluation of the sustainability of different transport systems in meeting the needs of civil society. 5
GENERIC SKILLS:	Communication, Collaboration, Organisation, 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.

7.1. Schedule

PERIOD AND TOPIC	ACTIVITIES
Semester	Weekly Workshops (2 hour) Asynchronous learning material

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?

Risk assessments have been performed for all field activities and a low level of health and safety risk exists. Some risks concerns may include working in an unknown environment as well as slip and trip hazards. 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%
- b. The course is graded using the Standard Grading scale
- c. 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. SafeUniSC

UniSC is committed to a culture of respect and providing a safe and supportive environment for all members of our community. For immediate assistance on campus contact SafeUniSC by phone: [07 5430 1168](tel:0754301168) or using the [SafeZone](#) app. For general enquires contact the SafeUniSC team by phone [07 5456 3864](tel:0754563864) or email safe@usc.edu.au.

The SafeUniSC Specialist Service is a Student Wellbeing service that provides free and confidential support to students who may have experienced or observed behaviour that could cause fear, offence or trauma. To contact the service call [07 5430 1226](tel:0754301226) or email studentwellbeing@usc.edu.au.

10.5. Study help

For help with course-specific advice, for example what information to include in your assessment, you should first contact your tutor, then your course coordinator, if needed.

If you require additional assistance, the Learning Advisers are trained professionals who are ready to help you develop a wide range of academic skills. Visit the [Learning Advisers](#) web page for more information, or contact Student Central for further assistance: +61 7 5430 2890 or studentcentral@usc.edu.au.

10.6. Wellbeing Services

Student Wellbeing provide free and confidential counselling on a wide range of personal, academic, social and psychological matters, to foster positive mental health and wellbeing for your academic success.

To book a confidential appointment go to [Student Hub](#), email studentwellbeing@usc.edu.au or call 07 5430 1226.

10.7. AccessAbility Services

Ability Advisers ensure equal access to all aspects of university life. If your studies are affected by a disability, learning disorder mental health issue, injury or illness, or you are a primary carer for someone with a disability or who is considered frail and aged, [AccessAbility Services](#) can provide access to appropriate reasonable adjustments and practical advice about the support and facilities available to you throughout the University.

To book a confidential appointment go to [Student Hub](#), email AccessAbility@usc.edu.au or call 07 5430 2890.

10.8. 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>

10.9. 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.

10.10. 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

Email: studentcentral@usc.edu.au