COURSE OUTLINE

CIV301 Road and Traffic Engineering

School: School of Science, Technology and Engineering

2025 | Semester 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 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 examines planning, design and construction of roads.
You will cover a number of topic areas including: road planning, the road traffic environment, design parameters, road geometric design, storm water drainage, road construction and road safety environment. The course also examines issues related to structural design of road pavements, rehabilitation of degraded pavements, geotechnical issues related to pavement engineering, pavement drainage and road surfacing. The types of roads include unbound pavements, asphalt pavements and chemically stabilised pavements.

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 discussion	1hr	Week 1	13 times
Tutorial/Workshop 2 – On campus workshop	2hrs	Week 1	13 times

1.3. Course Topics

Topics may include:

- History of Roads
- Geometric Design of Highway Facilities
- Pavement Materials
- Design of Flexible and Rigid Pavements
- Pavement Management
- Highway Drainage and Permeable Pavements
- Road Planning and Construction
- Ground Improvement

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 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 Compare and contrast the materials and construction techniques used in the construction of rigid and flexible pavements	Knowledgeable	1, 1, 1.3.a, 1.3.a, 1.3, 1.3
2 Examine soils and aggregates for pavement engineering applications	Creative and critical thinker	2, 2, 2.1.a, 2.1.a, 2.1, 2.1
3 Critically analyse the effects of traffic loading on pavement performance	Creative and critical thinker	2, 2, 2.1.b, 2.1.b, 2.1, 2.1
4 Design vertical and horizontal alignments for simple road sections	Empowered	2, 2, 2.3.a, 2.3.a, 2.3, 2.3
5 Design cross-sections for flexible and rigid pavements	Empowered	2, 2, 2.3.a, 2.3.a, 2.3, 2.3
6 Investigate aspects of pavement design/construction that have a significant impact on the environment and available novel, sustainable road design and construction solutions	Sustainability-focussed	1, 1, 1.6.c, 1.6.c, 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
1.3.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.
1.6.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.
1.3	Knowledge and Skill Base: In-depth understanding of specialist bodies of knowledge 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.
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.
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.

CODE	COMPETENCY
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.
2.1	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.
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.
1.6.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.
1.3	Knowledge and Skill Base: In-depth understanding of specialist bodies of knowledge 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.
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.
2.1	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.

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 or ENG202 or ENG206

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

ENG422

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

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	Written Piece	Individual	45%	Part A 750 words (+/– 10%) Part B 2000 words (+/– 10%)	Refer to Format	Online Assignment Submission with plagiarism check
All	2	Written Piece	Individual	15%	1500 words (+/– 10%)	Week 13	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 your ability to write an individual technical report encompassing the application of current practical and theoretical knowledge to solve complex technical engineering problems
PRODUCT:	Written Piece
FORMAT:	Your findings are to be formatted as a professional engineering report Part A: Week 4 Part B: Week 10
CRITERIA:	**No.** — **Learning Outcome assessed** 1 Application of road and drainage theory to plan a project — 1 5 6 2 Well written report to communicate plan to a professional audience — 6
GENERIC SKILLS:	Problem solving, Organisation, Applying technologies, Information literacy

All - Assessment Task 2: Pavement design report

GOAL:	Develop your ability to write an individual technical report that assesses the project site conditions, pavement design calculations, selection of appropriate pavement materials and construction method, recommended quality control tests. Pavement design should consider sustainability principles and material selection.
PRODUCT:	Written Piece
FORMAT:	Your findings are to be formatted as a professional engineering report

CRITERIA:

No.		Learning Outcome assessed
1	Development of an efficient pavement design based on site-specific inputs	1 2 3 4
2	Justification of the design and appropriate assumptions made in a succinct design report	5 6

GENERIC SKILLS:	Communication, Problem solving, Organisation

All - Assessment Task 3: Examination

GOAL:	Demonstrate your understanding and ability to apply methods of structural analysis and design.
PRODUCT:	Examination - not Centrally Scheduled
FORMAT:	2 hour online examination on any or all material covered in the course.

CRITERIA:

No.		Learning Outcome assessed
1	Comparison and contrast of the materials and construction techniques used in the construction of rigid and flexible pavements	1
2	Examination of soils and aggregates for pavement engineering applications	2
3	Critical analysis of the effects of traffic loading on pavement performance	3
4	Design of vertical and horizontal alignments for simple road sections	4
5	Design of cross-sections for flexible and rigid pavements	5
6	Investigation of aspects of pavement design/construction that have a significant impact on the environment and available novel, sustainable road design and construction solutions	6

GENERIC SKILLS:	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

> There are no required/recommended resources for this course.

8.2. Specific requirements

You will need to purchase and bring the following equipment with you to class from Weeks 1-8:
Engineering Scale Rule (1:100, 1:200, 1:250, 1:500)
Simple 300 mm ruler
Protractor (full 360 degree, 15cm diameter)
Compass (cheap one from supermarket)
2 pencils, soft and hard (e.g. HB and 3H) and one 0.4 - 0.5mm tip black felt pen
Pencil sharpener
Eraser
Scientific Calculator with Degrees, Minutes and Seconds (Polar-Rectangular conversion) function

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

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. 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 or using the SafeZone app. For general enquires contact the SafeUniSC team by phone 07 5456 3864 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 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