

# Unit Outline (Higher Education)

**Institute / School:** Institute of Innovation, Science & Sustainability

**Unit Title:** Road and Traffic Engineering

**Unit ID:** ENGRG2105

**Credit Points:** 15.00

**Prerequisite(s):** (ENGRG1002 and ENGRG1004)

**Co-requisite(s):** Nil

**Exclusion(s):** (ENGIN3205)

**ASCED:** 030909

**Description of the Unit:**

Road and Traffic Engineering offers a comprehensive exploration of traffic and transport systems, traffic flow characteristics, and fundamental road/pavement design and management principles. Students develop skills in designing signal timing, vertical and horizontal alignments, and analysing the impact of traffic loading on pavement performance. They also learn to design flexible and rigid pavement systems and apply knowledge to analyse survey data, address road safety concerns, and propose sustainable and resilient road/pavement design solutions. The main topics covered include traffic surveys, intersection design, pavement materials, drainage, and pavement management, preparing students to solve traffic, transport and pavement design challenges at a professional level.

**Grade Scheme:** Graded (HD, D, C, P, MF, F, XF)

**Work Experience:**

No work experience: Student is not undertaking work experience in industry.

**Placement Component:** No

**Supplementary Assessment:** Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment

**Course Level:**

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	✓	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Learning Outcomes:

On completion of the unit students will be able to:

#### Knowledge:

- K1.** Describe the traffic and transport system and its elements
- K2.** Describe the basic traffic flow variables and theories
- K3.** Recognize the fundamental principles of road/pavement design and management

#### Skills:

- S1.** Design optimal signal timing plans for intersections to enhance traffic flow and safety
- S2.** Design safe vertical and horizontal alignments for simple road sections
- S3.** Explain the effects of traffic loading on pavement performance
- S4.** Design, evaluate and recommend cross-sections for flexible and rigid pavements

#### Application of knowledge and skills:

- A1.** Analyse traffic survey data to extract vital information essential for optimizing transportation planning strategies
- A2.** Solve and report traffic, transport and pavement design problems at a professional standard
- A3.** Investigate novel, sustainable road design and construction solutions

#### Unit Content:

Topics may include:

- Traffic surveys
- Traffic flow theory
- Gap and queueing analysis
- Road safety
- Intersection design and control
- Geometric Design of Highway Facilities
- Pavement Materials — Soils, Aggregates and Bitumen
- Design of Flexible and Rigid Pavements
- Highway Drainage and Pavement Management

#### Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1-K3, S1, S3, S4, A1	(A) Participation in all learning activities, including attendance and participation in lectures and tutorials, exercises, recommended and supplementary readings, and/or other activities. (B) Undertake problem-solving of engineering problems relevant to traffic and road engineering in both invigilated and non-invigilated settings.	Assessed Tutorials; Quizzes; Assignments; and/or Tests	40 - 60%
K3, S1, S2, S4, A2, A3	Relates fundamental knowledge of traffic and road engineering to observations in a controlled environment and/or to solve design-based problems.	Reports; Presentation	40 - 60%

**Adopted Reference Style:**

IEEE

 Refer to the [library website](#) for more information

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