SCHOOL OF CIVIL ENGINEERING

Unit Outline Prepared by:	Jon Bunker	**Date**.:	April 2002
UNIT TITLE:	Transport Engineering 1	**UNIT CODE.**:	CEB323
DISCIPLINE CODE:	030909	**SEMESTER/YEAR**:	Sem 2, Year 3
CREDIT POINTS	12	**PREREQUISITES:**	Nil
STAFF DETAILS:			

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1. Rationale

The transport system is an essential element of our physical infrastructure. It is therefore imperative that civil engineers are able to undertake typical road and traffic engineering investigations, analyses and designs. This requires an understanding of the intent of individual elements of the road system, how they operate, and how they are delivered and managed, which will be developed in this unit. Further, it is important that civil engineers are able to undertake accurately, broader multi-modal transport surveys to gain an understanding of the utilisation of a particular transport system, which will also be developed.

2. Aims

The aims of this unit are to provide you with an understanding of the intent of individual elements of the road system, including road sections and intersections, and their interrelationships.

3. Objectives

Technical

If you participate in and pass this unit you should be able to:

1. demonstrate an understanding of the individual elements of the road system and their interrelationships;
2. analyse the operation of road system elements in the context of an investigation or design project environment;
3. produce technically robust designs of road system elements;
4. demonstrate an understanding of transport modelling techniques for transport system planning;
5. analyse and produce technically robust designs of road pavement structures; and
6. demonstrate the ability to work as part of a team to produce a successful transport project on a defined schedule.

Generic capabilities

By the completion of this unit, you should have become aware of your current abilities in the following generic and professional capabilities, and should have progressed in the development of them:

(a) *Communication* – written and graphical communication, and articulate ideas
(b) *Discipline Knowledge* – extensive theoretical knowledge, apply knowledge, discern deficits and maintain awareness
(c) *Work Practices* – manage time, achieve end results, accept responsibilities, and work with other disciplines
(d) *Interpersonal skills* – effective teamwork, emphathise and listening skills
(e) *Community & Global Awareness* – awareness of global issues and work sensitively
(f) *Environmental & Sustainability Awareness* – awareness of environmental and sustainability issues, understand and employ ESD principles
(g) *Ethical Behaviour* - sense of professional responsibility and value honesty and accountability
(h) *Thinking Skills & Problem Solving* – critical, creative, analytical and reflective thinking and solve problems
(i) *Information Literacy* – retrieve relevant information, continued development and lifelong learning
(j) *Systems Approach* – identify the primary purpose and users, decompose a system, trade off between cost and performance, identify and contrast and describe and compare systems

4. Content

- Elements of the road system, fundamentals of traffic engineering
- Gap acceptance theory
- Unsignalised intersection analysis and design
- Roundabout analysis and design
- Reflections
- Signalised intersection analysis and design
- Signalized intersection analysis and design
- Road Safety Audit
- Transport surveys
- Pavement analysis and design
- Design of Flexible Pavement (Catalogue method)
- Design of Flexible Pavement (Analytical method)
- Pavement maintenance

5. Teaching & Learning Approaches

This unit will consist of a mix of a series of structured lectures, tutorial and practical sessions, which will be held during two contact sessions each week. It is stressed that students attend both sessions each week in order to gain full advantage of the structured lectures and staff presence during tutorial sessions. Students must attend and participate in the practical session in order to receive marks for that item of assessment. The lectures will be provided by staff possessing specialist knowledge in areas of transport and pavement engineering. These staff will attend tutorial sessions following their lectures to assist students as they progress through their coursework. The unit coordinator will be available throughout the semester to provide guidance on overall aspects of the unit. Atendance at and participation in practical sessions are compulsory.

Teaching Mode

Hours per week	Lecture	Tutorial	Pracs
4	2	1.5	0.5

Learning Approaches

Problem-Based	Self-Learning	Individual	Team Based	Experiential Learning	Reflective	Exposition	Presentation
✓	✓	✓	✓	✓		✓	

6. Assessment

Component	Formative	Summative	%	Objectives
Lectures	X	-	-	1-5, (a)-(j)
Tutorials	X	-	-	1-6, (a)-(j)
Assignment 1 (fundamentals, unsig)	X	X	10	1,2,3,6, (a)-(j)
Assignment 2 (roundabouts, signals)	X	X	10	1,2,3,6, (a)-(j)
Assignment 3 (survey)	X	X	10	1,2,3,4,6, (a)-(j)
Assignment 4 (pavements)	X	X	10	3,5,6, (a)-(j)
Final examination held at the end of the semester		X	60	1-6, (a)-(j)
			100%	

7. Resource Materials

Reference Texts:

Ogden and Taylor 1996, *Traffic Engineering and Management*, Monash University.
Austroads 1997, *Pavement Design - A Guide to the Structural Design of Road Pavements*, AP-17/92.
Austroads 1994, *Road Safety Audit*, AP-30/94, Austroads, Victoria.
Austroads 1988, G*uide to Traffic Engineering Practice*, Part 3: Traffic Studies, AP-11.3/88, Austroads, Victoria.

8. Risk Management

Students will be informed of any requirements pertaining to a safe workplace. In lectures, tutorials and such, the information will include location of fire exits and meeting points in case of fire; in any laboratory practicals students will be advised of requirements of safe and responsible behaviour and will be required to wear appropriate protective items (e.g. steel capped shoes); on any field trips or site visits, all students will progress through a safety induction session and where necessary obtain a safety induction card. Students who do not follow legitimate instructions or who endanger the safety of others or do not act in accordance with the requirements of the Workplace Health and Safety Act, will be required to leave the session/site.