

# SCHOOL OF CIVIL ENGINEERING

Unit Outline Prepared by:	Dr J. Bunker	Date .:	November 2002
UNIT TITLE:	Professional Studies 7 (Civil Design Project) UNI	Г CODE.	: CEB414
DISCIPLINE CODE:	SEMESTER/	YEAR.:	Sem 2, Year 4
CREDIT POINTS	12		
PREREQUISITES:	BNB007, CEB207, CEB209, CEB214, CEB217, C CEB322, CEB323	CEB317, C	EB319, CEB321,
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# 1. Rationale

This unit is the seventh and final unit in the Professional Studies strand. Through preparation of various civil engineering design elements of a development project, this unit builds upon the earlier Professional Studies units to polish students' professional capabilities as expected of a graduate civil engineer. Further, students will be expected to *apply* to their project the knowledge and experience gained in the civil engineering subdisciplinary core units including: Geotechnical Engineering 1 and 2, Environmental Science, Hydraulic Engineering, Water and Wastewater Treatment, Water Engineering, and Transport Engineering.

## 2. Aims

The *aims* of this unit are to provide you with an understanding of the role of the civil engineer within a development project, including the various technical activities undertaken, overall project management, and an understanding of the community's expectations.

## 3. Objectives

#### Technical

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

- 1. Demonstrate an understanding of client and community requirements in a project environment;
- 2. Possess a detailed understanding of project design, integration and management concepts;
- 3. Produce technically robust designs in the sub-disciplines of civil works, environmental/geotechnical, transport, water/wastewater;
- 4. Demonstrate the ability to participate as an effective team member to produce a successful project outcome on a defined schedule;
- 5. Demonstrate the ability to lead a team to produce a successful project outcome on a defined schedule; and
- 6. critically review the work of others in a professional manner.

## 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* oral, 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, awareness of own limitations and work with other disciplines.
- (d) Interpersonal skills effective teamwork, emphathise, listening and negoation skills and assertiveness
- (e) Community & Global Awareness awareness of global issues, appreciate differences 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, value honesty and accountability and abide by Code of Ethics.
- (h) *Thinking Skills & Problem Solving* critical, creative, analytical and reflective thinking and solve problems.
- (i) *Information Literacy* use current technologies, 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

- Introduction to development planning and design. Briefing on the proposed development including location, site characteristics, project background, client requirements, timetable. Introduction to consultancy project planning and costing.
- Site layout (development style, features, amenities, building/activity compatibility, access, circulation and parking, foliage, sunlight requirements)
- Site civil design (assessment of topography and earthworks requirements, building and facilities location, circulation system, impacts on adjacent parcels, services system).

# • All design office

•	Transport Impact Assessment (transport network, SIDRA, existing conditions, base future conditions, trip generation distribution and assignment, with site conditions, impact mitigation, intersection design, parking facility design, alternative modes investigation, reporting requirements)	OR	•	Site stormwater design (hydrological analysis, pit location and design, pipe location and design, detention basin location and design, channel to creek location and design) PLUS Wastewater treatment design (loading analysis, pipe system design, plant design, treated water irrigation including pump design)
•	All design office			
•	All design office			
•	Review of environmental factors and Environmental Management Plan (air, water, noise, land, flora/fauna) PLUS	OR	OR •	Site stormwater design (as above) PLUS Wastewater treatment design (as
•	Environmental geotechnical design (contaminated ground, slope stability)			above)

#### • Design office

• Examination overview including project critical review technique

# 5. Teaching & Learning Approaches

This unit takes a "practice" based approach, where students will learn experientially through undertaking various activities typically encountered in a civil design project environment. Delivery will consist of a mix of design office sessions interspersed with briefing lectures to provide context and guidance on design processes and technique. This formal contact will occur during two contact sessions each week. It is stressed that students attend both sessions each week in order to gain full advantage of the briefing lectures and staff presence during design office (tutorial) sessions.

The briefing lectures will be provided by staff possessing specialist knowledge in each respective subdiscipline. These staff will attend design office sessions following their lectures to assist students as they progress through their designs. The unit coordinator/s will be available throughout the semester to provide guidance on *general* aspects of the project.

Students will be encouraged to use the unit's OLT web site, which will be provided as a central resource.

Students will conduct their studies in groups of four. Each group will submit four project submissions through the semester, including project proposal, site layout/civil works design, and two of the following; transport impact assessment, water/wastewater design, and environmental/geotechnical design. Each student in the group will have the opportunity to lead a project submission and will be required to submit a brief team leadership report one week after the project submission, which reflects their experience as team leader.

At the conclusion of the semester students will sit a final examination independently. This examination will require the student to critically review a project submission from another group, typically in the area that their own group did not cover during the semester.

## **Teaching Mode**

Hours per week	Lecture	Tutorial	Pracs
4	2	2	

#### **Learning Approaches**

Problem- Based	Self- Learning	Individual	Team Based	Experienti al	Reflective	Exposition	Presentati on
~	$\checkmark$	$\checkmark$	~	$\checkmark$	$\checkmark$	$\checkmark$	

# 6. Assessment

Students will work in groups of four to prepare their development project, which shall include the both formative and summative assessment.

Component	Formative	Summative	%	Objectives
Lectures	Х	-	-	1-6, (a)-(j)
Design office sessions	Х	-	-	1-5, (a)-(j)
Project proposal	Х	Х	10	1, 2, 4, (a)-(j)
Site layout/ civil works design	Х	Х	20	1-4, (a)-(j)
Transport Impact Assessment*	Х	Х	20*	1-4, (a)-(j)
Water and Wastewater Design*	Х	Х	20*	1-4, (a)-(j)
Environmental and Geotechnical Design*	Х	Х	20*	1-4, (a)-(j)
Team leadership report**	Х	Х	10	5, (a)-(j)
Final examination (project critic al review)	-	Х	20	1, 2, 6, (a)-(j)
			100%	

\* Each group shall submit two only from these three projects.

\*\* Each group member shall take a turn to lead one of the group's four submissions. They shall submit a team leadership report one week following submission of their project submission.

# 7. Resource Materials

No specific text books are required for this subject. Texts from previous disciplinary units will be useful. Certain resources will be provided to the students including some mapping, site characteristics, and technical data.

Students are expected as part of their project to identify, locate and acquire other resource material through libraries and the internet (particularly government department sites), and reference material gained in prior units.

## 8. Risk Assessment

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. Students will be responsible for their own health and safety, and as a responsible citizen, that of other members of the community, should the elect in their own time to conduct any site visits related to the project.