FACULTY OF ENGINEERING SCIENCE AND THE BUILT ENVIRONMENT

TT-1/2/11-		
Unit title:	Design and Practic	e
Unit number:	BCE/1/220	
Unit value:	1.0	
Unit co-ordinator:	P J Mellow	
Contact time:	Lectures 3	9 hours
	Tutorials 1	3 hours
Private study time:	98 hours	
Unit pre-requisites:	none	

SHORT DESCRIPTION

This unit introduces the student to the construction industry and the basic techniques needed to study and work in it. The student will learn about the personalities involved, their roles and social and environmental responsibility. Basic construction techniques and processes are explained and investigated.

AIMS

- To introduce students to the fundamental aspects of the design process
- To explain basic construction techniques, traditional and more recent developments
- To develop skills in drawing and communication of processes
- To explain the role of the engineer in society and their responsibility to other professionals
- To develop creativity
- To provide an introduction to environmental and safety issues
- To relate theory to practice in relation to the core engineering disciplines

LEARNING OUTCOMES

- To be able to produce good quality drawings in 2-D and free-hand perspective.
- The iterative design process
- An understanding of basic terminology, procedures and organisation of current civil engineering practice.
- Understand the fundamental concepts of design and distinguish between the requirements of strength, stiffness, stability, etc.
- Be familiar with many aspects of modern design including construction techniques and comparisons of different types of structures and materials
- The student will be aware of the engineer's responsibilities in respect of safety
- The choice of consruction plant, its procurement and cost
- To gain an awareness of risk

TRANSFERABLE SKILLS

- BECOME MORE AWARE OF THEIR RESPONSIBILTY FOR THEIR OWN LEARNING
- DEVELOP THE ABILITY TO SYNTHESISE AND TEST SOLUTIONS AGAINST GIVEN CRITERIA
- DEVELOP PATIENCE AND THE NEED TO LISTEN
- ABILITY TO UTILISE ENGINEERING SCIENCE IN SOLVING PROBLEMS
- WORK INDEPENDANTLY

TEACHING AND LEARNING PATTERN

Lectures by experienced engineers with appropriate handouts and group seminars intended to encourage discussion, peer review and critical comment. Students will present a seminar and develop skills in workshop sessions.

INDICATIVE CONTENT

The following topics will be addressed by the Unit:

Drawing: Fundamentals, including instruments, paper sizes, etc. standards, orthographic, isometric and perspective views.

Civil Engineering Practice: Organisation, basic terminology and procedures such as types of contract, site layout, scheme programming, bar charts, simple critical path analysis, bills of quantities

Conceptual Design: Design philosophy and fundamental concepts, strength, stiffness of materials, stability

Elements of Modern Design: Construction of building structures in cncrete, steel, masonry and timber. Techniques, comparisons, fire resistance, temporary works. Safety on site. Sources of risk. Elemental beam design, use of tables, manufacturers information, code of practice approach.

ASSESSMENT METHOD

<u>Continuous Assessment</u> based on short pieces of coursework. This will normally be comprised of drawings, a seminar presentation, critical path analysis and laboratory reports following model making, tests, etc and simple beam exercises.

INDICATIVE SOURCES

Core

Anon. Manual for the Design of Steelwork Buildings Structures. IStructE/ICE ****. Anon. Manual for the Design of Reinforced Concrete Structures. IStructE/ICE ****. Extracts from British Standards for Students of Structural Design, 3rd Edn. BSI ***

Background

Standard Method of Detailing Structural Concrete IStructE/ICE 1990 Higgins and Rogers, Designed and Detailed, BCA 1999 Ayrshire, Metsec, Multibeam, Catnic, IG, etc. Selection of current catalogues Gordon JE, Structures or Why Things Don't Fall Down, Penguin 1978 Finney and Fowler, Foundation Course (CDT) Collins 1986 Harris F, Construction Plant, Granada 1981 and Manufacturer's Catalogues Cavies, K, Tomasin, K, Construction Safety Handbook, Thomas Telford, 1996 Mainstone R, Developments in Structural Form, Architectural Press, 1998