FACULTY OF ENGINEERING SCIENCE AND THE BUILT ENVIRONMENT

Unit title:	Engineering Materials	
Unit number:	BCE/1/119	
Unit level:	1	
Unit value:	1.0	
Unit co-ordinator:	M. Gunn	
Contact time:	Lectures	24 hours
	Tutorials	8 hours
	Laboratories	8 hours
Private study time:	110 hours	
Total study time:	150 hours	
Unit pre-requisites:	None	

AIMS

To give the student a basic understanding of the structure, properties and applications of engineering materials and the relationship of their properties to performance in service.

LEARNING OUTCOMES

The student should be able to:

- recall basic facts about the composition of materials used in civil engineering construction
- recall how the materials are manufactured
- describe the standard tests which are performed to establish the properties of the materials
- describe how materials may degrade and how these durability issues can be addressed
- write laboratory reports

TEACHING AND LEARNING PATTERN

Lectures, tutorials and laboratory classes.

INDICATIVE CONTENT

Concrete

Portland cements. Cement replacement materials. Properties of aggregates. Admixtures. Properties of fresh and hardened concrete. Concrete testing. Durability of concrete.

Metals and alloys

Introduction to metallurgy. Ferrous and non-ferrous metals and their alloys. Metallic corrosion: causes, types, corrosion control.

Polymers and plastics

Thermoplastics and thermosetting materials. Glass reinforced plastics. Degradation of plastics.

Timber

Timber and timber products. Decay of timber and its preservation.

ASSESSMENT METHOD

The unit is assessed by a combination of examination and coursework with the proportion of marks allocated to each component given below:

Examination : 70%

Coursework: 30%

INDICATIVE SOURCES

Gordon, J.E., Science and engineering of materials (or: why you don't fall through the floor), Penguin, 1996 (3rd ed).

Gordon, J.E., Structures (or: why things don't fall down), Penguin, 1978.

Jackson, N. & Dhir, R.K., Civil engineering materials, Palgrave, 1996 (5th ed).

Taylor, G.D., Materials in construction: an introduction, Longman, 2000 (3rd ed).

Weidmann, G., Lewis, P. & Reid, N. (eds), Structural materials, Butterworth-Heinemann, 1990.