
FACULTY OF ENGINEERING SCIENCE AND THE BUILT ENVIRONMENT

Unit title:	Engineering Geology	
Unit number:	BCE/1/207	
Unit level:	1	
Unit value:	1.0	
Unit co-ordinator:	M. Gunn	
Contact time:	Lectures	20 hours
	Tutorials	9 hours
	Laboratories	4 hours
	Field Trip	57 hours
Private study time:	60 hours	
Total study time:	150 hours	
Unit pre-requisites:	None	

SHORT DESCRIPTION

This unit provides the student with an introduction to engineering geology and soils. Whilst traditional lectures are used as a means of delivering the course content there is an emphasis on the teaching in the field through the residential field trip. Consequently the field trip report forms a major component of the assessment of this unit.

AIMS

To give the student an appreciation of the origin, identification, and basic mechanical behaviour of geological materials. To introduce the student to geological processes and to develop an ability to identify geological features from maps and in the field

LEARNING OUTCOMES

The student should be able to:

- undertake rock identification,
- interpret simple geological maps and identify geological structures,
- appreciate the relevance and significance of geology in civil engineering,
- produce a technical report,
- provide a soil description,
- understand and apply a three-phase model for soil,
- undertake numerical calculations applying soil shear strength theory.

TEACHING AND LEARNING PATTERN

Lectures, tutorials, laboratory classes and a field trip.

INDICATIVE CONTENT

The structure of the earth

The crust, plate tectonics, temperature, density, isostasy, earthquakes.

Geological History

Stratigraphic column, eras, periods, orogenies.

Surface Processes and Engineering Geomorphology

Weathering, erosion and deposition., the work of rivers, the sea, wind, ice, and their control.

Rock and Soil Formation

Minerals, sedimentary, igneous, and metamorphic rocks, mechanical and chemical weathering.

Geological Structures

Folds, faults, and joints, geological maps and their interpretation.

Soil Properties

Three phase model, phase relationships and soil classification/description.

Soil and Rock Mechanics

Groundwater, pore pressure and effective stresses, shear strength. theory, rock and soil slope stability

ASSESSMENT METHOD

The unit is continually assessed, a major component of this is carried out in relation to the (compulsory) field trip.

INDICATIVE SOURCES

Blyth, F.G.H. & de Freitas, M. H., A geology for engineers, Edward Arnold, 1984 (7th ed).

Craig, R.F., Soil Mechanics, Chapman Hall, London, 2004 (7th ed).

Lisle, R.J., Geological Structures and Maps, 3rd Edition, Butterworth, 2003.

Manual of Applied Geology for Engineers, Institution of Civil Engineers, 1976

Waltham, A.C., Foundations of Engineering Geology, Spon, 2002 (2nd ed)

Whitten, D.G.A. and Brooks, J.R.V., The Penguin Dictionary of Physical Geology, Penguin, 1972.