

## Module specification

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Module code	AURH456
Module title	Geology and Soil Mechanics
Level	4
Credit value	20
Faculty	Arts, Science and Technology
Module Leader	Louise Duff
HECoS Code	100551
Cost Code	GABE

## Programmes in which module to be offered

Programme title	Is the module core or option for this programme
HNC Civil Engineering	Core

## Pre-requisites

## Breakdown of module hours

Learning and teaching hours	48 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	0 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
<b>Total active learning and teaching hours</b>	<b>48 hrs</b>
Placement / work based learning	0 hrs
Guided independent study	152 hrs
<b>Module duration (total hours)</b>	<b>200 hrs</b>

<b>For office use only</b>	
Initial approval date	13/4/21
With effect from date	01/09/21

<b>For office use only</b>	
Date and details of revision	29/06/2021 Administrative change to module code
Version number	1

## Module aims

The purpose of this module is to facilitate an informed understanding of the description and classification of geological material, and to demonstrate the significance of ground investigation in site analysis.

The module will explain processes and techniques utilised in contemporary soils testing practice, with particular reference to the requirements of prevailing Codes of Practice, Eurocodes and the associated analysis of laboratory data.

## Module Learning Outcomes - at the end of this module, students will be able to:

1	Describe the common rock types, their mode of formation, geographical/geological distribution and uses within construction and civil engineering.
2	Assess the engineering performance of rock materials and rock masses.
3	Undertake the processes of soil description and classification, and the determination of basic soil properties.
4	Explain the establishment of the primary design parameters for soils including the role of ground investigation techniques.
5	Produce a proposal to address identified geotechnical weaknesses and problems.

## Assessment

Indicative Assessment Tasks:

This section outlines the type of assessment task the student will be expected to complete as part of the module. More details will be made available in the relevant academic year module handbook.

1. Calculate and classify the characteristics of rock materials in civil engineering. (2hrs)
2. Maintain a portfolio of laboratory reports on soil properties as the basis for the preparation of a soil investigation case study for a proposed civil engineering scheme, and produce a proposal to address identified geotechnical weaknesses and problems. (2,400 words equiv.)

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1,2	In-class test	40

2	3, 4 & 5	Portfolio	60%
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## Derogations

None

## Learning and Teaching Strategies

A range of strategies will be employed in communicating technical content, with practical investigation of soil and rock samples underpinning didactic delivery in the exploration of characteristics and properties. Laboratory-based analyses will form the basis of investigative learning in both individual and group contexts towards the establishment of design parameters and limiting constraints.

## Indicative Syllabus Outline

**Common rock types, their mode of formation, geographical/geological distribution:** igneous, sedimentary and metamorphic rocks; petrographic classification of igneous rocks; stable and unstable minerals.

**Rock materials and rock masses:** petrographic and engineering description/classification of rocks with reference to current codes of practice; Rock Mass Rating.

**Soil description and classification, basic soil properties:** carry out classification tests to current codes of practice, determine fundamental soil properties, effective stress on the strength and deformation of soil, drained and un-drained behaviour of soils, calculate stress and pressure for soils under hydrostatic conditions, seepage.

**Primary design parameters for soils:** common methods for the determination of strength, compressibility and permeability to current codes of practice, acquisition of soil samples for laboratory testing, in-situ testing

## Indicative Bibliography:

Please note the essential reads and other indicative reading are subject to annual review and update.

### Essential Reads

Barnes, G. (2016), *Soil Mechanics: Principles and Practice* 4th Edition, London: Palgrave Macmillan

McLean, A. and Gribble, C. (1985) *Geology for Civil Engineers*. Abingdon: Taylor and Francis.

### **Other indicative reading**

Smith, I (2014) *Elements of Soil Mechanics* 9th Edition, Chichester: John Wiley and Sons.

Waltham, A. (2009) *Foundations of Engineering Geology* 3rd Edition, Abingdon: Taylor and Francis.

BS EN 1997-1 Eurocode 7: Geotechnical design Part 1 2004

BS EN 1997-2 Eurocode 7: Geotechnical design Part 2 2007

Websites:

[New Civil Engineer Journal](#)

[Institution of Civil Engineers Proceedings](#)

[Geology.com](#)

[Thomas Telford](#)

## **Employability skills – the Glyndŵr Graduate**

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Each module and programme is designed to cover core Glyndŵr Graduate Attributes with the aim that each Graduate will leave Glyndŵr having achieved key employability skills as part of their study. The following attributes will be covered within this module either through the content or as part of the assessment. The programme is designed to cover all attributes and each module may cover different areas.

### **Core Attributes**

Engaged

### **Key Attitudes**

Commitment

Confidence

Adaptability

### **Practical Skillsets**

Organisation

Critical Thinking