

## Module specification

When printed this becomes an uncontrolled document. Please access the **Module Directory** for the most up to date version by clicking on the following link: [Module directory](#)

Module Code	AUR4A2
Module Title	Geotechnics
Level	4
Credit value	20
Faculty	Faculty of Arts, Computing & Engineering
HECoS Code	101106
Cost Code	GABE

## Programmes in which module to be offered

Programme title	Is the module core or option for this programme
BEng (Hons) Civil Engineering Degree Apprenticeship	Core

## Pre-requisites

None

## Breakdown of module hours

Learning and teaching hours	30 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	6 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
<b>Total active learning and teaching hours</b>	<b>36 hrs</b>
Placement / work-based learning	0 hrs
Guided independent study	164 hrs
<b>Module duration (total hours)</b>	<b>200 hrs</b>

For office use only	
Initial approval date	3 <sup>rd</sup> July 2024
With effect from date	September 2024
Date and details of revision	
Version number	1

## Module aims

To facilitate an understanding of the basic principles of soil formation, description, and classification of geological material to include rocks and soils.



To consider processes and techniques utilised in contemporary soils testing practice, with reference to the requirements of prevailing Codes of Practice, Eurocodes, and the associated analysis of laboratory data.

Students will be expected to consider site investigation techniques and apply basic principles of soil mechanics to offer solutions for geotechnical problems.

**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 assess the engineering performance of rock materials and rock masses.
2	Undertake laboratory experiments and apply relevant knowledge and information to undertake the processes of soil description and classification, and the determination of basic soil properties.
3	Explain the establishment of the primary design parameters for soils and consider ground investigation techniques.
4	Produce a design solution to address an identified geotechnical problem and identify environmental and social risks/impacts.

## Assessment

Indicative Assessment Tasks:

1. In- class test to address rock and soil formation, soil description, classification and laboratory analysis. (2hrs)
2. Coursework. A series of tasks using the principles of geotechnics to solve broadly defined engineering problems (indicative word count: 2,000 words)

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.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1,2	In-class test	50
2	3,4	Coursework	50

## Derogations

None

## Learning and Teaching Strategies

The module will be presented to students through planned lecture series and programmed workshops and tutorials. An active and inclusive approach is used to engage students in the topics and will involve individual, group work and flipped learning experiences aligned to the university's Active Learning Framework (ALF). The approach offers students a flexible and



adaptive learning experience that can accommodate a range of options that includes both on campus learning and remote learning where appropriate.

The Moodle VLE and other on-line materials and resources will be available to support learning. ALF offers a balance between the classroom elements and digitally enabled activity incorporating flexible and accessible resources and flexible and accessible feedback to support learning.

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 analysis will form the basis of investigative learning in both individual and group contexts towards the establishment of design parameters and limiting constraints.

Tutorials – Close interaction with students ensuring that the work presented during lectures has been understood, with specific help being given to overcome any learning problems, should they occur.

## Indicative Syllabus Outline

---

Engineering Geology.

Soil description and classification.

Laboratory testing to include Permeability, Shear strength, Compressibility, Compaction of soils, Consolidation and Liquid and plasticity indices.

Site and Ground Investigation techniques.

Introduction to Foundation design.

Introduction to Retaining structure design.

## Indicative Bibliography:

---

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

### Essential Reads

Barnes, G.E. (2016), *Soil Mechanics, Principles and Practice*. 4th Ed. Hampshire: Palgrave Macmillan.

### Indicative Reads

Waltham A.C. (2009), *Foundations of Engineering Geology*. 3rd Ed. Spon Press

Smith, I. (2014), *Smith's Elements of Soil Mechanics*. 9th Ed. John Wiley & Sons.

BS 5930:2015 2020, Code of Practice for Ground Investigation, BSI, London.

BS EN 1997-1:2004+A1:2013, Eurocode 7: Geotechnical Design, General Rules

BS EN 1997-2:2007, Eurocode 7: Geotechnical Design, 2007, - Part 2: Ground Investigation and Testing.

Chartered Institute of Architectural Technologists [www.ciat.org.uk](http://www.ciat.org.uk)

Chartered Institute of Building [www.ciob.org.uk](http://www.ciob.org.uk)

Ordnance Survey [www.ordnancesurvey.co.uk/](http://www.ordnancesurvey.co.uk/)

Royal Institution of Chartered Surveyors [www.rics.org](http://www.rics.org)

Institution of Civil Engineers [www.ice.org.uk](http://www.ice.org.uk)

Royal Institute of British Architects [www.architecture.com](http://www.architecture.com)

Designing Buildings Wiki [www.designingbuildings.co.uk](http://www.designingbuildings.co.uk)

Institution of Structural Engineers ([www.istructe.org.uk](http://www.istructe.org.uk))

**Other sources:**

IHS Database [www.ihsti.com](http://www.ihsti.com)