

## Module specification

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Module Code	AUR6A6
Module Title	Geotechnical Design and Temporary Works
Level	6
Credit value	20
Faculty	FACE
HECoS Code	100150
Cost Code	GABE

### Programmes in which module to be offered

Programme title	Core/Optional/Standalone
BEng (Hons) Civil Engineering Degree Apprenticeship	Core

### Breakdown of module hours

Learning and teaching hours	24 hrs
Placement tutor support hours	0 hrs
Supervised learning hours e.g. practical classes, workshops	6 hrs
Project supervision hours	0 hrs
<b>Active learning and teaching hours total</b>	<b>30 hrs</b>
Placement hours	0 hrs
Guided independent study hours	170hrs
<b>Module duration (Total hours)</b>	<b>200 hrs</b>

### Module aims

This module will help you to develop the skills required of a civil engineer working in today's construction industry. The module aims to enable students to use problem-based learning to understand the principles of geotechnics and their application to design and construction of civil engineering projects. The module presents the fundamentals of shallow and deep foundations, site investigation techniques, retaining structures, slope stability and ground improvement. These concepts rely on the understanding of the main principles of soil mechanics, in particular the compressibility and shear strength of soils.

The module will also provide you with an introduction to into temporary works which may include formwork, falsework, excavation stability and support, crane bases, etc. You will learn about the

background to the field of temporary works and develop an understanding of the regulatory framework and codes of practice and of common elements of temporary works basic details and outline design criteria. A clear understanding of the risk assessment criteria and project control processes for temporary works will also be developed. Practical work within this module includes practical demonstrations, seminars, laboratory and tutorial work, use of appropriate ICT and problem-based scenarios.

### Module Learning Outcomes

At the end of this module, students will be able to:

1	Apply knowledge of mathematics, natural science and engineering principles to design geotechnical structures to meet the demands of real-world situations.
2	Select and apply appropriate computational and analytical techniques to critically evaluate the stability and sustainability of geotechnical systems and structures, demonstrating engineering judgement.
3	Identify the temporary works requirements for a project/task and produce clear technical justification and rationale for the development of a concise design brief and low-risk temporary works solution.
4	Use a risk management process to identify the key H&S risks associated with the temporary works and apply risk assessment criteria to inform the design and risk control measures

### Assessment

Indicative Assessment Tasks:

This section outlines the type of assessment task the student will be expected to complete as part of the module.

Assessment 1:

Individually prepared coursework requiring the design of geotechnical structures in a given civil engineering context. (indicative word count: 3,000 words). The assessment will be based on developing an understanding of site investigation data, design of geotechnical structures and the critical evaluation of stability and sustainability of design proposals, demonstrating engineering judgement.

Assessment 2:

Assessment 2 Students will be required to produce an individual presentation to develop a brief and temporary works design solution for a civil engineering problem, together with a risk management process to address temporary works health and safety risks and control measures. (indicative word count: 1,000 words)

Assessment number	Learning Outcomes to be met	Type of assessment	Duration/Word Count	Weighting (%)	Alternative assessment, if applicable
1	LO1 L02	Coursework	3000	70%	
2	L03 L04	Presentation	1000	30%	

## Derogations

N/A

## Learning and Teaching Strategies

The module will be presented to students through planned lecture series, combined with interactive sessions using practical laboratory work and use of software. 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. 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

## Welsh Elements

Students can present their work, access forms, resources, email correspondence, work placements and personal tutorials in Welsh.

## Indicative Syllabus Outline

- Soil parameters and properties relevant to applied geotechnical design such as stresses in soils, geostatic, lateral earth pressure, compression and consolidation of soils, settlement, governing equations, analytical solutions, bearing capacity of foundations: types of foundations, analytical methods for determination of the ultimate bearing capacity.
- Site investigation.
- Ground improvement
- Retaining structures.
- Shallow foundations.
- Deep foundations.
- Settlement analysis
- Slope analysis including slopes in granular materials, circular arc analysis under undrained conditions, method of slices, wedge analysis, progressive failure, end-of construction and long-term stability.
- Temporary Works History & code of practice Bragg report BS 5975
- The risk assessment process and appropriate control procedures
- Typical temporary works elements

- Excavations, working platforms, haul roads and foundations
- Falsework, formwork and shoring
- Scaffold
- Concrete pressures, striking and back propping

### Indicative Bibliography

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

Essential Reads:

Knappett, J., Craig, C.F. (2020), *Craig's Soil Mechanics*. 9th ed. CRC Press.

Filip, R. (2025), *Temporary Works Part Two: Further Principles of Design and Construction*. Leeds. Emerald Publishing Ltd.

Other indicative reading:

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

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

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

British Standards Institution (2024), BS 5975-1: *Management Procedures*. London. British Standards Institute.

British Standards Institution (2024), BS 5975-2: *Falsework Design*. London. British Standards Institute.

British Standards Institute (2020), BS 5930: *Code of Practice for Ground Investigation*. London. British Standards Institute.

British Standards Institute (2013), BS EN 1997-1: *Eurocode 7: Geotechnical Design, General Rules*. London. British Standards Institute.

British Standards Institute (2007), BS EN 1997-2:2007 *Eurocode 7: Geotechnical Design, Part 2: Ground Investigation and Testing*. London. British Standards Institute

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

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

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



### Administrative Information

<b>For office use only</b>	
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