

ES3G1-15 Geotechnical Engineering I

20/21

Department

School of Engineering

Level

Undergraduate Level 3

Module leader

Gary Fowmes

Credit value

15

Module duration

24 weeks

Assessment

50% coursework, 50% exam

Study location

University of Warwick main campus, Coventry

Description

Introductory description

ES3G1-15 - Geotechnical Engineering I

[Module web page](#)

Module aims

All Civil Engineers require a sound understanding of geotechnical engineering. This module gives a basic geological knowledge base and introduces a number of fundamental principles and key applications appropriate to the level of the module and the framework of the course.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Introduction to geo-hazards
Soil & Rock description and classification
Geological Structures and Maps
Principle of Effective Stress
Permeability and Groundwater flow; Filters

Compressibility and consolidation
Strength of Soils & Rock, Critical State Soil Mechanics.

Learning outcomes

By the end of the module, students should be able to:

- Identify the importance and role of geotechnical engineering within the Civil Engineering profession.
- Construct and interpret geological maps, extending their skills of graphical and spatial interpretation.
- Compare a range of soil and rock types, adopting professionally recognised systems for categorisation and description.
- Apply the Principle of Effective Stress to a range of typical geotechnical problems in order to predict the ground response under different conditions of loading, soil type and groundwater states.
- Select appropriate tests and strength criteria for rocks and soils. Use these to predict their behaviour under loading. Explain the processes active within these materials when loaded.
- Communicate in a professional and scientific manner.

Indicative reading list

Barnes G., Soil Mechanics: Principles and Practice, Palgrave, 3rd ed. 2010
Blyth, F.G.H. & de Freitas, M.H., Geology for Engineers, Butterworth-Heinemann, 2004
Craig, R.F., Soil Mechanics, 8th Ed., Spon Press, 2012
Smith, G.N. & Smith I.N., Elements of Soil Mechanics, 9th Ed., Wiley Blackwell, 2014

Subject specific skills

Lectures, example classes, laboratory, geological maps, fieldwork.

Transferable skills

No transferable skills defined for this module.

Study

Study time

Type	Required
Lectures	20 sessions of 1 hour (13%)
Practical classes	8 sessions of 1 hour (5%)
Fieldwork	8 sessions of 1 hour (5%)
Total	150 hours

Type	Required
Other activity	8 hours (5%)
Private study	106 hours (71%)
Total	150 hours

Private study description

106 hours of guided independent learning (including VLE use and support from Employer)

Other activity description

6 hours of examples classes

2 hours of revision classes

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group C

	Weighting	Study time
Coursework	50%	
Coursework (specification and outline design of geotechnical project (10 pages length))		
Online Examination	50%	

- Online examination: No Answerbook required
- Students may use a calculator
- Engineering Data Book 8th Edition
- Graph paper

Feedback on assessment

Coursework: individual feedback returned.

Feedback in class during example classes.

Model solutions to questions for exam preparation.

Cohort level feedback on examination.

[Past exam papers for ES3G1](#)

Availability

Pre-requisites

1 (core module)

Post-requisite modules

If you pass this module, you can take:

- ES3G4-15 Geotechnical Engineering II

Courses

This module is Core for:

- Year 3 of DESA-H221 Undergraduate Civil and Infrastructure Engineering (Non-integrated Degree Apprenticeship)