

Module Template for New and Revised Modules¹

Module Code	CEU44A51
Module Name	4A5(1) Geotechnical Engineering I
ECTS Weighting²	5 ECTS
Semester taught	Semester 1
Module Coordinator/s	David Igoe
<u>Module Learning Outcomes</u> with reference to the <u>Graduate Attributes</u> and how they are developed in discipline	<p>On successful completion of this module, students should be able to:</p> <p>LO1. Predict the effective stresses in the ground for hydrostatic and artesian conditions</p> <p>LO2. Assess the principal tests used to determine the strength, stiffness and compressibility parameters of soil and when they are used</p> <p>LO3. Determine the stresses in the ground due to the loading from a foundation on the surface</p> <p>LO4. Estimate the elastic and consolidation settlements of a foundation</p> <p>LO5. Determine the at rest, active and passive earth pressures on retaining walls</p> <p>LO6. Design a cantilever embedded and a gravity retaining wall</p> <p>LO7. Calculate the bearing capacity and design a shallow foundation</p> <p>LO8. Analysis of slope stability using slip surfaces and method of slices</p> <p>Graduate Attributes: levels of attainment</p> <p>To act responsibly - Enhanced</p> <p>To think independently - Enhanced</p> <p>To develop continuously - Enhanced</p> <p>To communicate effectively - Enhanced</p>
Module Content	<p>The objectives of the module are to advance from the basic soil mechanics principles presented in the JS CEU33A5 module, so as to:</p> <ul style="list-style-type: none">• Provide students with a good understanding of the properties of soil and how to determine them• Enable students carry out geotechnical designs involving slope stability, bearing capacity, settlement of spread foundations and earth pressures acting on retaining structures

¹ [An Introduction to Module Design](#) from AISHE provides a great deal of information on designing and re-designing modules.

² [TEP Glossary](#)

Teaching and Learning Methods

Lectures, Invited talks, Laboratory Practicals and Tutorials.

Assessment Details³
Please include the following:

- **Assessment Component**
- **Assessment description**
- **Learning Outcome(s) addressed**
- **% of total**
- **Assessment due date**

Assessment Component	Assessment Description	LO Addressed	% of total	Week due
Examination	2 hour examination	LO1-8	80	
Coursework	6 x Online Tutorials and 2 x Practicals in Geotech Lab	LO1-8	20	

Reassessment Requirements

Contact Hours and Indicative Student Workload³

<p>Contact hours: 38 hours (Online Lectures + Labs + Tutorials)</p>
<p>Independent Study (preparation for course and review of materials): 40 hours</p>
<p>Independent Study (preparation for assessment, incl. completion of assessment): 45 hours</p>

Recommended Reading List

Craig's Soil Mechanics, Eighth Edition. Jonathan Knappett and R.F. Craig. CRC Press.

Module Pre-requisite

CEU33A5

Module Co-requisite

Module Website

<https://www.tcd.ie/Engineering/undergraduate/baiyear4/modules/4A5.pdf>

Are other Schools/Departments involved in the delivery of this

No

³ [TEP Guidelines on Workload and Assessment](#)

module? If yes, please provide details.

Module Approval Date

Approved by

Academic Start Year September 2022

Academic Year of Date 2022-23