

<b>Module Code</b>	CEU44A51
<b>Module Name</b>	4A5(1) Geotechnical Engineering I
<b>ECTS Weighting<sup>2</sup></b>	5 ECTS
<b>Semester taught</b>	Semester 1
<b>Module Coordinator/s</b>	David Igoe
<b><a href="#">Module Learning Outcomes</a> with reference to the <a href="#">Graduate Attributes</a> and how they are developed in discipline</b>	<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><b>Graduate Attributes: levels of attainment</b></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>
<b>Module Content</b>	<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"> <li>• Provide students with a good understanding of the properties of soil and how to determine them</li> <li>• Enable students carry out geotechnical designs involving slope stability, bearing capacity, settlement of spread foundations and earth pressures acting on retaining structures</li> </ul>

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

<sup>2</sup> [TEP Glossary](#)

**Teaching and Learning Methods**

Lectures, Invited talks, Laboratory Practicals and Tutorials.

**Assessment Details<sup>3</sup>**  
**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	5 x Tutorials and 2 x Practicals in Geotech Lab	LO1-8	20	

**Reassessment Requirements**

100% Written Examination

**Contact Hours and Indicative Student Workload<sup>3</sup>**

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

**Recommended Reading List**

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

**Module Pre-requisite**

CEU33A05

**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

<sup>3</sup> [TEP Guidelines on Workload and Assessment](#)

**module? If yes, please provide details.**

**Module Approval Date**

**Approved by**

**Academic Start Year** September 2024

**Academic Year of Date** 2024-25