

<b>Module Code</b>	CEU44A51
<b>Module Name</b>	4A5(1) Geotechnical Engineering I
<b>ECTS Weighting<sup>1</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> <ol style="list-style-type: none"> <li>1. Predict the effective stresses in the ground for hydrostatic and artesian conditions</li> <li>2. Assess the principal tests used to determine the strength, stiffness and compressibility parameters of soil and when they are used</li> <li>3. Determine the stresses in the ground due to the loading from a foundation on the surface</li> <li>4. Estimate the elastic and consolidation settlements of a foundation</li> <li>5. Determine the at rest, active and passive earth pressures on retaining walls</li> <li>6. Design a cantilever embedded and a gravity retaining wall</li> <li>7. Calculate the bearing capacity and design a shallow foundation</li> <li>8. Analysis of slope stability using slip surfaces and method of slices</li> </ol> <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 3A5 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>

**Teaching and Learning Methods**

Lectures, Laboratory Practicals and Tutorials.

<b>Assessment Details<sup>2</sup></b> <b>Please include the following:</b> <ul style="list-style-type: none"> <li>• <b>Assessment Component</b></li> <li>• <b>Assessment description</b></li> <li>• <b>Learning Outcome(s) addressed</b></li> <li>• <b>% of total</b></li> <li>• <b>Assessment due date</b></li> </ul>	Assessment Component	Assessment Description	LO Addressed	% of total	Week due			
	Examination	2 hour online take home examination	LO1-8	80%				
	Coursework	6 x Online Tutorials and 2 x Practicals in Geotech Lab	LO1-8	20%				
<b>Reassessment Requirements</b>	100% written examination							
<b>Contact Hours and Indicative Student Workload<sup>2</sup></b>	<table border="1"> <tr> <td><b>Contact hours:</b> 38 hours (Online Lectures + Labs + Tutorials)</td> </tr> <tr> <td><b>Independent Study (preparation for course and review of materials):</b> 40 hours</td> </tr> <tr> <td><b>Independent Study (preparation for assessment, incl. completion of assessment):</b> 45 hours</td> </tr> </table>					<b>Contact hours:</b> 38 hours (Online Lectures + Labs + Tutorials)	<b>Independent Study (preparation for course and review of materials):</b> 40 hours	<b>Independent Study (preparation for assessment, incl. completion of assessment):</b> 45 hours
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<b>Independent Study (preparation for course and review of materials):</b> 40 hours								
<b>Independent Study (preparation for assessment, incl. completion of assessment):</b> 45 hours								
<b>Recommended Reading List</b>	Craig's Soil Mechanics, Eighth Edition. Jonathan Knappett and R.F. Craig. CRC Press.							
<b>Module Pre-requisite</b>	CEU33A5							
<b>Module Co-requisite</b>								
<b>Module Website</b>	<a href="https://www.tcd.ie/Engineering/undergraduate/baiyear4/modules/4A5.pdf">https://www.tcd.ie/Engineering/undergraduate/baiyear4/modules/4A5.pdf</a>							
<b>Are other Schools/Departments involved in the delivery of this module? If yes, please provide details.</b>								
<b>Module Approval Date</b>								
<b>Approved by</b>								
<b>Academic Start Year</b>	September 2021							

**Academic Year of Date**

2021-22