**Module Code**  
CEU44A51

**Module Name**  
4A5(1) Geotechnical Engineering I

**ECTS Weighting**  
5 ECTS

**Semester taught**  
Semester 1

**Module Coordinator/s**  
David Igoe

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**Module Learning Outcomes with reference to the Graduate Attributes and how they are developed in discipline**

On successful completion of this module, students should be able to:

1. Predict the effective stresses in the ground for hydrostatic and artesian conditions
2. Assess the principal tests used to determine the strength, stiffness and compressibility parameters of soil and when they are used
3. Determine the stresses in the ground due to the loading from a foundation on the surface
4. Estimate the elastic and consolidation settlements of a foundation
5. Determine the at rest, active and passive earth pressures on retaining walls
6. Design a cantilever embedded and a gravity retaining wall
7. Calculate the bearing capacity and design a shallow foundation
8. Analysis of slope stability using slip surfaces and method of slices

**Graduate Attributes: levels of attainment**

To act responsibly - Enhanced  
To think independently - Enhanced  
To develop continuously - Enhanced  
To communicate effectively - Enhanced

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**Module Content**  
The objectives of the module are to advance from the basic soil mechanics principles presented in the JS 3A5 module, so as to:

- 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
Teaching and Learning Methods

Lectures, Laboratory Practicals and Tutorials.
### Assessment Details

Please include the following:

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

<table>
<thead>
<tr>
<th>Assessment Component</th>
<th>Assessment Description</th>
<th>LO Addressed</th>
<th>% of total</th>
<th>Week due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination</td>
<td>2 hour online take home examination</td>
<td>LO1-8</td>
<td>80%</td>
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<tr>
<td>Coursework</td>
<td>6 x Online Tutorials and 2 x Practicals in Geotech Lab</td>
<td>LO1-8</td>
<td>20%</td>
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### Reassessment Requirements

100% written examination

### Contact Hours and Indicative Student Workload

<table>
<thead>
<tr>
<th>Component</th>
<th>Contact hours:</th>
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<tbody>
<tr>
<td>Online Lectures + Labs + Tutorials</td>
<td>38 hours</td>
</tr>
</tbody>
</table>

**Independent Study (preparation for course and review of materials):**

40 hours

**Independent Study (preparation for assessment, incl. completion of assessment):**

45 hours

### Recommended Reading List


### Module Pre-requisite

CEU33A5

### Module Co-requisite

### Module Website


### Are other Schools/Departments involved in the delivery of this module? If yes, please provide details.

### Module Approval Date

September 2021
Academic Year of Date 2021-22