CE7S01: S1 – Geotechnical Engineering [5 credits]

Module co-ordinator: Associate Prof. Brendan O’Kelly (bokelly@tcd.ie)

Lecturer(s): Associate Prof. Brendan O’Kelly (50%) and Assistant Professor David Igoe (igoed@tcd.ie) (50%)

Pre-Requisite Modules: Students must have successfully completed undergraduate modules in Soil Mechanics and (or) Geotechnical Engineering

Module organisation
27 lectures, and the coursework elements described in the Assessment section.

Module description, aims and contribution to programme
This module will cover a selection of geotechnical engineering topics in depth, including the construction processes and the advancements and latest research developments in the topic areas. Specific topics included are listed in the Module Content section. The aim is to provide an understanding of the geotechnical concepts and processes and the application of geotechnical principles and practical guidelines in geotechnical engineering practice.

Learning outcomes
To understand and apply appropriately in geotechnical design:
   1. Basic geotechnical principles and processes
   2. Embankments on soft ground
   3. Ground improvement techniques
   4. Laboratory and field testing
   5. Ground investigation and monitoring
   6. Piled Foundations
   7. Retaining Walls

Module content
- Ground improvement options and their application for various site-specific ground conditions.
- Embankments on soft ground: design, construction and monitoring.
- Pile foundation design and practice - applying Eurocodes.
- Advanced retaining wall design.
- Geotechnical properties of peat, with a focus on strength measurement, interpretation and recommended use in design practice.
Teaching strategies
27 lectures + coursework that includes essay assignment and tutorials

Assessment
Written examination plus coursework and tutorial exercises during the semester.
Overall module marks comprises: Examination = 85%; coursework = 15%

The coursework element consists of two Design Exercises (7.5%) and one 1500 word typewritten essay assignment (7.5%)

Recommended textbook