Module Code	CE7S01
Module Name	Geotechnical Engineering
ECTS Weighting[1]	5 ECTS
Semester taught	Semester 2
Module Coordinator/s	Module Coordinator: Prof. Brendan O'Kelly (bokelly@tcd.ie) Module delivery also by Prof. David Igoe (igoed@tcd.ie)
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 understand and apply: LO1. Basic soil behaviour, geotechnical engineering principles and processes LO2. Laboratory shear strength testing LO3. Embankment design and construction on soft ground LO4. Ground investigation and monitoring LO5. Ground improvement techniques for various soil deposits LO6. Piled foundations LO7. Retaining walls **Graduate Attributes: levels of attainment** To act responsibly - Enhanced To think independently - Enhanced To develop continuously - Enhanced To communicate effectively - Enhanced
Module Content	This module will cover a selection of geotechnical engineering topics, in depth, including associated construction processes, and the latest research developments in specific topic areas: • Determination of the Atterberg (consistency) limits and recent research developments in this area. • Laboratory shear strength testing — standard and advanced testing methods • Embankments on soft ground: design, construction and monitoring. • Ground improvement options for various problematic ground conditions. • Pile foundation design and practice – applying Eurocodes. • Advanced retaining wall design. 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.

Teaching and Learning Methods	27 lectures, and the coursework elements described in the Assessment section. 19 lectures are delivered by Dr. O'Kelly and 8 lectures are delivered by Dr. Igoe.

Assessment Details[2]
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
L01–L07	Written examination		85%	
	Coursework, two exercises from Dr. Igoe		15%	

Reassessment Requirements	100% Reassessment Examination

Contact Hours and Indicative Student Workload[2]	**Contact hours:**
	Independent Study (preparation for course and review of materials):
	Independent Study (preparation for assessment, incl. completion of assessment):
Recommended Reading List	Craig's Soil Mechanics, 2020, Ninth Edition. Jonathan Knappett and R.F. Craig. CRC Press.
Module Pre-requisite	Students must have successfully completed an undergraduate module(s) in Soil Mechanics and/or Geotechnical Engineering.
Module Co-requisite	
Module Website	
Are other Schools/Departments involved in the delivery of this module? If yes, please provide details.	No
Module Approval Date	

Approved by	
Academic Start Year	September 2025
Academic Year of Date	2025–2026