

Module Title:	Geotechnical Engineering II	
Language of Instruction:	English	
Credits:	5	
NFQ Level:	7	
Module Delivered In	2 programme(s)	
Teaching & Learning Strategies:	Projects Practicals Continuous assessments Terminal exam Private study	
Module Aim:	The aims of the module are: (1) to provide the graduate with appropriate technical skills in analysis, design and construction work in the geotechnical area; (2) to work effectively as an individual and in teams. (3) to provide the graduate with the opportunity to progress to honours degree level in civil engineering.	
Learning Outcomes		
<i>On successful completion of this module the learner should be able to:</i>		
LO1	Select appropriate parameters related to soil behaviour for design purposes to assist in an appropriate and efficient design	
LO2	Analyse and evaluate stresses in soil with an appreciation of the difference between drained and undrained/short-term vs long term conditions	
LO3	Analyse the stability of simple slopes/excavations, earth retaining structures, including the responsibilities and roles of relevant parties	
LO4	Explain Eurocode 7 and its application	
LO5	Interpret the requirements for temporary works design including the time duration vs ground conditions and the H&S implications	
Pre-requisite learning		
Module Recommendations <i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>		
6566	ENGR H3503	Geotechnical Engineering I
Incompatible Modules <i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i>		
No incompatible modules listed		
Co-requisite Modules		
No Co-requisite modules listed		
Requirements <i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.</i>		
No requirements listed		

Module Content & Assessment

Indicative Content
(1) Stresses in a Soil Mass (a) Stresses due to overburden - evaluation of undrained and drained design conditions
(2) Geology (a) Rock forming minerals and crystallography (b) Elementary petrology (c) Stratigraphy and palaeontology (d) Earth building forces (e) Weathering and landscape change (f) Erosion and deposition
(3) Settlement (a) Immediate settlement based on elastic theory (b) Consolidation settlement (c) One dimensional consolidation test
(4) Shear Strength (a) Review of Coulomb theory and undrained shear test (b) Consolidated undrained triaxial test with porewater pressure measurement
(5) Foundations (a) Ultimate & serviceability limit state design (b) Introduction to piles and piling (c) Ultimate & serviceability limit state design of shallow foundations (d) Understanding the difference between undrained and drained analysis
(6) Retaining Walls (a) Types of retaining walls (b) Wall types – permanent vs. temporary, gravity, cantilever, basement, buttress/counterfort walls, propped, anchored (c) Selection criteria for retaining wall types (d) Retaining wall construction/installation (e) Drainage of walls (f) Modes of Failure (g) Lateral earth pressures and forces (i) Stability–overturning, sliding (h) Application of software packages
(8) Stability of Slopes (a) Stability of cuttings and embankments (b) Bio-engineering solutions (c) Groundwater control
(9) Sustainability and Ground Improvement (a) Compaction (b) Chemical stabilization and grouting (c) Geotextiles and geomembranes

Assessment Breakdown	%
Continuous Assessment	10.00%
Project	20.00%
Practical	20.00%
End of Module Formal Examination	50.00%

Continuous Assessment				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Examination	In-class and home assessments	2,3	10.00	n/a

Project				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Project	Analysis and design projects	1,2,3,4,5	20.00	n/a

Practical				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Written Lab Report	1,2,3	20.00	n/a

End of Module Formal Examination				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	No Description	1,2,3,4	50.00	End-of-Semester

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

Module Workload

Workload: Full Time		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Contact Hours	12 Weeks per Stage	4.00
Estimated Learner Hours	12 Weeks per Stage	8.00
Total Hours		144.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_CMHCE_B	Bachelor of Engineering (Honours) in Civil Engineering	4	Mandatory
CW_CMCIV_D	Bachelor of Engineering in Civil Engineering	6	Mandatory