

Module Title:	Earthworks Analysis	
Language of Instruction:	English	
Credits:	5	
NFQ Level:	7	
Module Delivered In	2 programme(s)	
Teaching & Learning Strategies:	Lectures Practicals Private study	
Module Aim:	The aims of the module are: (1) to produce graduates capable of working with minimal supervision in a modern construction environment; (2) to provide graduates to the workplace capable of participating in all facets of earthworks, on-site, in the laboratory and in the design office, using the industry recognised Standards and Procedures; (3) to give graduates the skills to set up and manage quality control in the construction, quarrying, monitoring and testing industries; (4) to provide graduates with sufficient knowledge and skills to continue to degree level in civil engineering	
Learning Outcomes		
On successful completion of this module the learner should be able to:		
LO1	Analyse and test soils for earthworks and construction of foundations for structures, roads, dams, embankments (a) Reuse of materials (b) Testing regimes for cut/fill applications (c) Use of BSI 2015, BS 5930 - Ground Investigation (d) Specification for Ground Investigation, 2016, Engineers Ireland	
LO2	Demonstrate competence in hazard identification, risk assessment and safe use of laboratory and field test equipment. Have awareness of potential health, safety hazards and risks associated with design of earthworks, dams, roads, foundations including the responsibilities of persons, identification of hazards and risk assessment requirements	
LO3	Appreciate the requirements for testing of unbound materials and the analysis and evaluation for the re-usability of soils and aggregates for civil engineering projects, including the re-use of waste and excavated material for the purposes of environmental sustainability	
LO4	Identify the appropriate site investigation techniques for differing ground conditions and development types including selection of appropriate laboratory tests depending project requirements	
LO5	Have the ability to assess constructions considerations of differing ground conditions and the implications to the construction process including the implications of changes in the properties of soils and why they occur.	
Pre-requisite learning		
Module Recommendations		
This is prior learning (or a practical skill) that is recommended before enrolment in this module.		
6801	ENGR H3504	Earthworks Analysis
Incompatible Modules		
These are modules which have learning outcomes that are too similar to the learning outcomes of this module.		
No incompatible modules listed		
Co-requisite Modules		
No Co-requisite modules listed		
Requirements		
This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.		
No requirements listed		

Module Content & Assessment

Indicative Content

Sustainability and Reusability of excavated and waste materials

Laboratory testing (a) CBR, MCV, DD vs Moisture Content (b) evaluation of reusability tests (c) Health and Safety (d) Reuse of Waste Materials (e) Soil stabilization

Soil Strength Testing

Evaluation of soils strength parameters - drained and undrained (a) Shear box tests (b) Triaxial tests Health and Safety

Ground Investigation

(a) Site investigation – advantages and disadvantages of methods (b) Specifying site investigation (c) Trial Pitting, Dynamic Probing, Cable Percussive Boreholes (d) Coreholes (e) Groundwater (f) Health and Safety

In-situ sampling and testing

(a) Plate Bearing Tests (b) Shear Vane tests (c) Standard Penetration testing (d) California Bearing ratio (CBR) (e) Health and Safety

Sustainable Construction Methods

(a) Construction of embankments and cuttings (b) Capping and sub-base layers (c) Quality control monitoring (d) Chemical stabilization of soils for reuse as engineering material (e) Compaction (f) Geotextiles and geomembranes and uses

Stakeholder Engagement

Analysis, planning and dissemination of alternatives to influence stakeholders, including direct and indirect impacts

Self-Assessment

Students assess own lab reports and input during testing

Assessment Breakdown

	%
Continuous Assessment	100.00%

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Other	n/a	1,2,3,4,5	100.00	n/a

No Project

No Practical

No End of Module Formal Examination

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>
Lecture	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