ENGR H4502: Engineering Geology

Module Title:	Engineering Geology
Language of Instruction:	English

Credits:	10

NFQ Level:	8

Module Delivered In	2 programme(s)

Teaching & Learning Strategies:	Lectures. Demonstrations. Project work. Practicals and Site visits. Site visits and private study

Module Aim:	The aims of this module are to a) extend the learner's engineering knowledge base associated with surfical and bedrock geology, groundwater and surface water, b) build on the knowledge introduced in Geotechnics Year 3. c) To enable the learner to appreciate the interaction between ground and human activity in civil engineering projects and to d) incorporate this understanding into design and construction. e) To appreciate and have a general understanding of groundwater, f) to appreciate the formation of topography by water and ice agents. g) to understand the technologies available to investigate and understand geohazards, to gain an appreciation of the interaction of the physical environment on development and how impacts can be recognised, eliminated or mitigated.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Assess the requirements of a development as they relate to ground and groundwater and select the appropriate investigative techniques
LO2	Interpret general geomorphological and subsurface conditions based on the use of desk study mapping, site reconnaissance, invasive and non-invasive techniques.
LO3	Appreciate the depositional characteristics of various soil and bedrock deposits and how they influence development
LO4	Assist in risk assessment and design in relation to geohazards

Pre-requisite learning
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*
No recommendations listed
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.*
Bachelor of Engineering (Ordinary) in Civil Engineering

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Module Content & Assessment

Indicative Content
Geohazards Risk assessment and management of geohazards Desk studies
Geophysics Introduction to Geophysics, Geophysics contracts, Seismic, Electrical resistivity, Gravity and magnetic surveys, Geophysical borehole logging and electromagnetic methods.
Geomorphology Introduction to concepts of landform genesis including formation, identification and engineering application
Fluvial Geomorphology Applications of fluvial geomorphology, fundamentals of fluvial geomorphological assessment
Glaciation Introduction to glaciers and glaciation; Landforms; Transportation of sediment; Formations; Deposits; Engineering uses
Hard Rock Geology Excavability; Stability analysis; Use and reuse
Sedimentology and stratigraphy Introduction to principles of sediment and sedimentary rock formation, transport, classification, and depositional environments
Hydrogeology Application of groundwater hydrology, to groundwater control and dewatering in construction.
Ground Investigation SI factual report - Contents, SI Interpretation of subsurface conditions Construction of in-place monitoring instrumentation - GW and Gas
Sustainable urban development Introduction to SUD's, implications for development
Design Team Project Acting as part of a design team in the Civil/Geotechnical Engineering role with the Architectural Technologists (Year 3) on design team project - geotechnical and structural advisors - predominately geo based
Evaluation of rock cores Laboratory testing UCS, PLT, Core logging

Assessment Breakdown	%
Continuous Assessment	10.00%
Project	20.00%
Practical	10.00%
End of Module Formal Examination	60.00%

Continuous Assessment

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Examination	Exam Term 1	1,2,3,4	5.00	n/a
Examination	Exam Term 2	1,2,3,4	5.00	n/a

Project

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Project	Project	1,2,3,4	20.00	Sem 1 End

Practical

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	No Description	1,2,3,4	10.00	Sem 1 End

End of Module Formal Examination

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	Exam	1,2,3,4	60.00	End-of-Semester

ITCarlow reserves the right to alter the nature and timings of assessment

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Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lecture	30 Weeks per Stage	2.00
Practicals	30 Weeks per Stage	1.00
Estimated Learner Hours	30 Weeks per Stage	4.00
	Total Hours	210.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_CMHCE_B	Bachelor of Engineering (Honours) in Civil Engineering - Ab Initio	5	Mandatory
CW_CMCEN_B	Bachelor of Engineering (Honours) in Civil Engineering - Add On	1	Mandatory