

Module Title:	Environmental Hydraulics I
Credits:	5
NFQ Level:	8
Module Delivered In	1 programme(s)
Teaching & Learning Strategies:	Lectures Project Work Private Study
Module Aim:	The aims of the Hydraulics portion of this module is: (1) to develop students application of the concepts of hydraulic design The aims of the Environmental Engineering portion of this module is: (1) to enable the learner to apply their scientific knowledge to the design and construction of sustainable water supply and wastewater treatment systems; (2) to enable the learner to collate and interpret hydrological data; (3) to enable the learner to participate in flood risk assessment and management.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	compare & critically evaluate (a) the framework of relevant legal requirements for the treatment & disposal of Wastewater; (b) the codes of practice & industry standards & the need for their application; (c) appropriate foul & storm drainage components & systems.
LO2	examine, identify & use appropriate methods for application to new & broadly-defined foul drainage problems.
LO3	select & apply appropriate communication tools to present technical information on drainage systems, its components &/or design process.
LO4	participate in the collation, assessment and interpretation of hydrological data and assist in the assessment of flood risk
LO5	assess & quantify surface water and groundwater sources and contribute to the design of production boreholes and intakes
LO6	work as part of a design team

Pre-requisite learning
Module Recommendations <i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>
No recommendations listed
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) Basic Principles of Design Sewers (a) Sewerage systems (b) System Components (c) Layout of Sewers
(2) Legislation on Treatment & Disposal of Wastewater (a) Water Framework Directive (b) EPA Acts (c) EC (Drinking Water) Regulations
(3) Foul sewer Drainage Design (a) Water Consumption Method (b) Discharge Unit Method
(4) Pumping Station Design (a) Hydraulic gradient in pump-pipeline systems (b) Multiple pump systems (c) Pump performance (d) Pump selection
(5) Elements of the Hydrological Cycle (a) Precipitation analysis, (b) Water Balance Assessment, (c) Extreme event analysis
(6) Assessment of Surface Water Sources (a) Volume assessment (b) Baseflow (c) Dry weather flows (d) Catchment assessment (e) Baseline water quality (f) Flood Risk Assessment
(7) Groundwater Hydrology (a) Desk-top study, Interrogation of web based databases (b) Geological field assessment (c) Application of Geophysical surveys to groundwater assessments (d) Trial well drilling (e) Aquifer assessment (f) Well testing (g) Baseline water quality

Assessment Breakdown	%
Project	50.00%
End of Module Formal Examination	50.00%

No Continuous Assessment

Project				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Project	No Description	1,2,3,4,5,6	50.00	n/a

No Practical

End of Module Formal Examination				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	No Description	1,2,4,5	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>
Lecture	12 Weeks per Stage	4.00
Estimated Learner Hours	12 Weeks per Stage	6.50
Total Hours		126.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_CMHCE_B	Bachelor of Engineering (Honours) in Civil Engineering	7	Mandatory