ZSCI H2102: Environmental Science

Module Title:	Environmental Science
Language of Instruction:	English

Credits:	5

NFQ Level:	6

Module Delivered In	1 programme(s)

Teaching & Learning Strategies:	This module will be taught in one theory class of one hour duration for 30 weeks and one 3 hour practical per week for 10 weeks. To consolidate lectures and practicals, students will normally be required to carry out assignments and prepare a weekly practical report analysing their own research and results. Any course-related issue or questions that may arise will be discussed at lectures.

Module Aim:	To introduce the student to the fundamentals of environmental science and environmental analysis

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Describe the principles of environmental theory and practice.
LO2	Appreciate the dynamic interactive nature of the environment.
LO3	Perform a representative range of physico-chemical analyses of water and waste, applicable to pollution and environmental assessment.
LO4	Understand and interpret Reports from EPA and other bodies
LO5	To be able to communicate principles/theory in environmental science in both written and oral formats in an effective and professional manner.

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.*
Successful completion of year 1 or equivalent

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Module Content & Assessment

Indicative Content
The Environment The four spheres of the environment, dynamic nature and interactions, natural cycles, pollution as an imbalance.The environment and health
The Lithosphere Soil formation, generalised chemical composition of mineral (silicates/aluminates) and organic matter (humic/fulvic acids). Soil profiles and horizons, soil texture and ped structure, soil properties :pH, conductivity, cation exchange, nutrient cycling.
The Hydrosphere The hydrological cycle. Water sheds/river basins. River and lake structure and zones, groundwater/aquifers, surface water quality (phosphates, nitrates, ammonia, organic matter, dissolved oxygen, BOD and COD), trophic status, eutrophication, pollution sources (point-source v diffuse). Representative sampling. EPA reports. Catchment management.
Water treatment Unit processes in treatment of raw water to potable water. Alum coagulation and flocculation, Jar Tests, filtration, disinfection (chlorination/ozone/uv), fluoridation. Residuals. Parametric values, PV. EPA Compliance reports. Waste water treatment (screenings/homogenation/aeration-activated sludge/trickle filters/anoxic-anaerobic, disinfection), Urban Waste Water Directive
The Atmosphere Chemical composition, stratification, ozone, CFCs, greenhouse gases, particulate matter, acid rain, CAFE Directive, air quality monitoring.
The Biosphere Biodiversity, invasive species, conservation, Birds/Habitat Directive (SPA, SAC)
The EPA Establishment, structure, roles. licencing, IPPC.
Practical Practicals will develop skills and compentences in soil and water/waste water analysis. Practicals to include Soil testing for pH, moisture, conductivity, nutrients, texture and organic matter (Walkey-Black method and LOI). Water analysis will include colour, turbidity, conductivity, chloride(Mohr). nitrate (uv method), phosphate (mrp), dissolved oxygen (Winkler), BOD and COD (Hach micro-digestion).

Assessment Breakdown	%
Continuous Assessment	10.00%
Practical	40.00%
End of Module Formal Examination	50.00%

Special Regulation
Students must achieve a minimum grade (35%) in both the practical/CA and final examination.

Continuous Assessment

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Open-book Examination	Exam	1,2,3,4	5.00	n/a
Presentation	Students will present a 10 minute presentation on a topic of their choice relating to environmental science	5	5.00	Sem 2 End

No Project

Practical

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	Practical Log Book	3	40.00	Sem 1 End

End of Module Formal Examination

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	3 hour exam	1,2,3,4	50.00	End-of-Semester

SETU Carlow Campus 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	1.00
Laboratory	30 Weeks per Stage	1.00
Estimated Learner Hours	30 Weeks per Stage	2.00
	Total Hours	120.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_SASES_B	Bachelor of Science (Honours) in Environmental Science	2	Mandatory