

# ZSCI H2102: Environmental Science

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       To introduce the learner should be able to:         L01       Describe the principles of environmental theory and practice.         L02       Appreciate the dynamic interactive nature of the environment.         L03       Perform a representative range of physico-chemical analyses of water and waste, applicable to pollution and environmental analyses					
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 por 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 tectures.         Module Aim:       To introduce the student to the fundamentals of environmental science and environmental analysis         Learning Outcomes       To introduce the student to the fundamentals of environmental science and environmental analysis         Con successful completion of this module the learner should be able to:       Does of environmental theory and practice.         LO1       Describe the principles of environmental theory and practice.       Describe the principles of environmental theory and practice.         LO2       Appreciate the dynamic interactive nature of the environment.       Describe the principles of physico-chemical analyses of water and waste, applicable to pollution and environmental assessment.         LO4       Understand and interpret Reports from EPA and other bodies       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       or aractical skill) that is recommended before enrolment in this module.	Module Title:		Environmental Science		
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Successful completion of year 1 or equivalent			practical skill) that is mandatory before enrolment in this module is allowed.		



ZSCI H2102: Environmental Science

## **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



## ZSCI H2102: Environmental Science

## 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	