

<b>Module Title:</b>	Environmental Science
<b>Language of Instruction:</b>	English
<b>Credits:</b>	5
<b>NFQ Level:</b>	7
<b>Module Delivered In</b>	<a href="#">2 programme(s)</a>
<b>Teaching &amp; Learning Strategies:</b>	This module will be taught in one theory class of one hour duration for 12 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.
<b>Module Aim:</b>	To introduce the student to the fundamentals of environmental science and environmental analysis
<b>Learning Outcomes</b>	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Describe the principles of environmental theory and practice.
LO2	Perform a representative range of physico-chemical analyses of water and waste, applicable to pollution and environmental assessment.
LO3	Demonstrate an understanding of and interpret Reports from EPA and other bodies
<b>Pre-requisite learning</b>	
<b>Module Recommendations</b> <i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>	
No recommendations listed	
<b>Incompatible Modules</b> <i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i>	
No incompatible modules listed	
<b>Co-requisite Modules</b>	
No Co-requisite modules listed	
<b>Requirements</b> <i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.</i>	
Successful completion of year 1 or equivalent	

## 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 competences in soil and water/waste water analysis. Practical 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	60.00%
Practical	40.00%

### Special Regulation

Students must achieve a minimum grade (35%) in both practical and CA components.

### Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Multiple Choice Questions	Students must obtain a minimum grade (35%) in their combined CA	1,2,3	25.00	Week 6
Examination	Students must obtain a minimum grade (35%) in their combined CA	2	25.00	Week 12
Presentation	Students will present a 10 minute presentation on a topic of their choice relating to environmental science		10.00	Sem 2 End

No Project

### Practical

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Students must achieve a minimum grade of 35% in their practicals and must obtain a minimum grade of 40% when CA and Practical grades are combined.	2	40.00	Sem 1 End

No End of Module Formal Examination

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

**Module Workload**

<b>Workload: Full Time</b>		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	12 Weeks per Stage	2.00
Laboratory	12 Weeks per Stage	2.50
Estimated Learner Hours	30 Weeks per Stage	2.37
Total Hours		125.00

**Module Delivered In**

Programme Code	Programme	Semester	Delivery
CW_SAPHA_B	<a href="#">Bachelor of Science (Honours) in Pharmaceutics and Drug Formulation</a>	6	Mandatory
CW_SAASC_D	<a href="#">Bachelor of Science in Analytical Science</a>	6	Mandatory