APPROVED

ENVI6002: Environmental Instrumentation

Module Details

Module Code:	ENVI6002
Title:	Environmental Instrumentation APPROVED
Long Title:	Environmental Instrumentation
NFQ Level:	Fundamental
Valid From:	Semester 1 - 2019/20 (September 2019)
Duration:	1 Semester
Credits:	5
Field of Study:	4220 - Environmental Science
Module Delivered in:	9 programme(s)
Module Description:	This module provides an introduction to environmental measuring technologies.The module will draw extensively from EPA resources and reports with particular reference to sources and types of pollution arising from industrial facilities, agriculture, transport and energy production.

Learning Outcomes	
On successful completion of this module the learner will be able to:	
#	**Learning Outcome Description**
LO1	Identify the various sources of pollution that contribute to the potential degradation of the environment with particular reference to industrial and agricultural development in Ireland.
LO2	Use EPA resources and reports to obtain scientific information on environmental issues with particular reference to air quality, water quality and climate change.
LO3	Use in line probes to acquire and analyse data on a variety of water and air quality parameters.

Dependencies
Module Recommendations
Incompatible Modules
No incompatible modules listed
Co-requisite Modules
No Co-requisite modules listed
Requirements
No requirements listed

Indicative Content
Sources of Pollution and IPPC licensing Pollution: Main sources of contamination in soil, air and water. Introduction to air and water emission monitoring. European legislation, Water framework directive, CAFE Directive.
Water and Air Quality Groundwater vs surface water. Inline measurement of pH, conductivity, turbidity, DO, TOC, phosphates, nitrates, chlorine etc. Introduction to potable water and wastewater treatment, both industrial and municipal. Ambient air vs stack emissions. Measurement of CO, CO2, ozone, particulates, SOX and NOX.
Waste and recycling: Incineration, site remediation, hazardous waste, carbon footprint, introduction to recycling. Air abatement techniques.
Climate Change Effects such as air temperature, CO2 levels and ocean acidity. Sources and relative contribution of greenhouse gases. Mitigation strategies.

Module Content & Assessment

Assessment Breakdown	**%**
Coursework	100.00%

Assessments

Coursework			
Assessment Type	Short Answer Questions	**% of Total Mark**	30
Timing	Week 7	**Learning Outcomes**	1,2
Assessment Description Assessment of lecture material			
Assessment Type	Short Answer Questions	**% of Total Mark**	40
Timing	Week 13	**Learning Outcomes**	1,2
Assessment Description Assessment of lecture material			
Assessment Type	Practical/Skills Evaluation	**% of Total Mark**	30
Timing	Every Week	**Learning Outcomes**	3
Assessment Description Experiment and lab assessment			

No End of Module Formal Examination

Reassessment Requirement
Repeat examination *Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.*

Module Workload

Workload: Full Time					
Workload Type	*Contact Type*	*Workload Description*	*Frequency*	*Average Weekly Learner*	*Hours*

				Workload	
Lecture	Contact	Course material	Every Week	2.00	2
Lab	Contact	Experiment and assessment	Every Week	2.00	2
Independent & Directed Learning (Non-contact)	Non Contact	Study lecture material	Every Week	3.00	3
				Total Hours	7.00
				Total Weekly Learner Workload	7.00
				Total Weekly Contact Hours	4.00

Workload: Part Time

Workload Type	*Contact Type*	*Workload Description*	*Frequency*	*Average Weekly Learner Workload*	*Hours*
Lecture	Contact	Course material	Every Week	1.50	1.5
Lab	Contact	Experiment and assessment	Every Week	1.50	1.5
Lecturer-Supervised Learning (Contact)	Contact	Directed study	Every Week	1.00	1
Directed Learning	Non Contact	Study	Every Week	3.00	3
				Total Hours	7.00
				Total Weekly Learner Workload	7.00
				Total Weekly Contact Hours	4.00

Module Resources

Supplementary Book Resources

Al Gore. (2006), An Inconvenient Truth, Bloomsbury, London, [ISBN: 0-7475-8906-2].

Pradyot Patnaik. (2010), Handbook of Environmental Analysis: Chemical Pollutants in Air, Water, Soil, and Solid Wastes, Second Edition, 2. CRCpress, [ISBN: 9781420065817].

Recommended Article/Paper Resources

EPA. (2017), Air Quality in Ireland 2016, [ISSN: 978-1-840].

EPA. (2013), Integrated Water Quality Report 2011.

EPA. (2017), National Ambient Air Quality Monitoring Programme 2017-2022.

EPA. (2017), Water Quality in Ireland 2010-2015.

EPA. (2013), Emissions form IPPC Industry: Quantifying Pollution Trends & Regulatory Effectiveness.

EPA. (2013), Air Quality Monitoring Report.

Other Resources

Website, EPA. Environmental Protection Agency, http://www.epa.ie

Website, Robert Emmet Hernan. Environmental matters on the island of Ireland, http://www.irishenvironment.com/

Module Delivered in

Programme Code	Programme	Semester	Delivery
CR_SCHQA_8	Bachelor of Science (Honours) in Analytical Chemistry with Quality Assurance	-1	Mandatory
CR_SESST_8	Bachelor of Science (Honours) in Environmental Science and Sustainable Technology	-1	Mandatory
CR_SINEN_8	Bachelor of Science (Honours) in Instrument Engineering	-1	Mandatory
CR_SCHEM_7	Bachelor of Science in Analytical and Pharmaceutical Chemistry	-1	Mandatory
CR_SPHYS_7	Bachelor of Science in Applied Physics and Instrumentation	-1	Mandatory
CR_SPHYS_6	Higher Certificate in Science in Applied Physics and Instrumentation	-1	Mandatory
CR_SCHEM_6	Higher Certificate in Science in Chemistry	-1	Mandatory
CR_SOMNI_7	Physical Sciences (Common Entry)	-1	Mandatory
CR_SOMNI_8	Physical Sciences (Common Entry)	-1	Mandatory