

Module Details	
Module Code:	ENVR S8013
Full Title:	Ecotoxicology APPROVED
Valid From::	Semester 1 - 2018/19 (September 2018)
Language of Instruction:	
Duration:	1 Semester
Credits::	5
Module Owner::	Valerie McCarthy
Departments:	Unknown
Module Description:	<p>This module will explore the principles of ecotoxicology by examining the effects of toxic chemicals on organisms at different organisational levels from individual to ecosystem. The principal types of environmental contaminants and their fate and transport within the environment will be assessed. Common methods and approaches of detection and assessment of environmental contaminants will be examined. Emphasis will be placed on ecotoxicological testing and other approaches used to evaluate the environmental risk of chemicals / contaminants.</p>

Module Learning Outcome	
On successful completion of this module the learner will be able to:	
#	Module Learning Outcome Description
MLO1	Demonstrate a clear appreciation of the fundamental concepts of ecotoxicology.
MLO2	Assess the main types of environmental contaminant including their sources and pathways into the environment.
MLO3	Evaluate the effects of chemicals at different levels of biological organisational hierarchy (DNA to populations).
MLO4	Design, set up, sample and perform laboratory toxicity tests and critically synthesise ecotoxicological data from the scientific literature.
Pre-requisite learning	
Module Recommendations	
<p><i>This is prior learning (or a practical skill) that is strongly recommended before enrolment in this module. You may enrol in this module if you have not acquired the recommended learning but you will have considerable difficulty in passing (i.e. achieving the learning outcomes of) the module. While the prior learning is expressed as named DkIT module(s) it also allows for learning (in another module or modules) which is equivalent to the learning specified in the named module(s).</i></p>	
No recommendations listed	

Module Indicative Content
Introduction to Principals of Ecotoxicology Basic concepts in ecotoxicology, types of toxic pollutants and routes of entry, inorganic and organic pollutants, organometal compounds, nanoparticles, mechanistic basis of ecotoxicology.
Fate and transport of chemicals in the environment Origin of pollutants, fate and distribution of pollutants in the environment including land and water, environmental persistence, biodegradability, environmental factors affecting toxicity, biological transformations, bioaccumulation and bioavailability.
Fate of pollutants in individuals and ecosystems Types of toxicity, processes of uptake, acute, chronic, lethal, sub-lethal and cumulative effects, biochemical, physiological, behavioural and morphological reactions to pollution, teratogenesis, mutagenesis and carcinogenesis, principles of dose-response, tolerance and regulation, reactions to pollution stress, endocrine disruption.
Monitoring and ecotoxicological test systems Regulatory requirements and EU legislation, principles of environmental risk, quantification of the effects of risk factors, the effects of pollutants and the methods used to assess these effects at different organisational levels, ecosystem, community, population, whole organism, tissue, cellular and subcellular, biomarkers used to monitor pollutant effects, in vivo and in vitro bioassays, methods of measuring the effects of pollution, measuring toxicity using test organisms; bacteria, algae, Daphnia, Artemia, bivalves, fish and crustaceans, LC50, EC50, NOEC, toxicity curves, lethal dose studies, behavioural change, morphological change, growth and development, field studies, mesocosms.
Sample Practicals Toxicity tests in the laboratory using standard test algae, determination of the LC50 of a pollutant using test organism e.g. Artemia/Daphnia, effect of a pollutant on the osmoregulatory ability of the lugworm, effects of a heavy metal pollutant in sediments on the burrowing behaviour of marine bivalves, measurement of the biodegradability of a pollutant. Characterisation of plastic waste by fourier transform IR spectroscopy

Module Assessment	
Assessment Breakdown	%
Course Work	10.00%
Practical	30.00%
Final Examination	60.00%

Module Special Regulation

Assessments

Full Time On Campus

Course Work			
Assessment Type	Written Report	% of Total Mark	10
Marks Out Of	0	Pass Mark	0
Timing	S1 Week 6	Learning Outcome	1,2,3
Duration in minutes	0		
Assessment Description Each student will be asked to evaluate a case study on some aspect of ecotoxicology. The study will be presented using one of a number of different possible methods e.g. type-written report, poster or oral presentation.			

No Project

Practical			
Assessment Type	Practical/Skills Evaluation	% of Total Mark	30
Marks Out Of	0	Pass Mark	0
Timing	n/a	Learning Outcome	4
Duration in minutes	0		
Assessment Description Practicals			

Final Examination			
Assessment Type	Formal Exam	% of Total Mark	60
Marks Out Of	0	Pass Mark	0
Timing	End-of-Semester	Learning Outcome	1,2,3
Duration in minutes	120		
Assessment Description End-of-Semester Final Examination			

Module Workload

Workload: Full Time On Campus

<i>Workload Type</i>	<i>Contact Type</i>	<i>Workload Description</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>	<i>Hours</i>
Lecture	Contact	No Description	Every Week	3.00	3
Practical	Contact	No Description	Every Week	2.00	2
Independent Study	Non Contact	No Description	Every Week	4.00	4
				Total Weekly Learner Workload	9.00
				Total Weekly Contact Hours	5.00

This module has no Part Time On Campus workload.

Module Resources
<i>Recommended Book Resources</i>
C.H. Walker, R.M. Silby, S.P. Hopkin, D.B. Peakal. (2012), Principles of Ecotoxicology, 1st. CRC Press (Taylor a Francis Grp), FL, USA, [ISBN: 978-1-4398-62].
<i>Supplementary Book Resources</i>
<p>D.W. Connell. (1999), Introduction to Ecotoxicology, 3rd. Blackwell Sciences, UK, [ISBN: 0632038527].</p> <p>Tim Sparks. (2000), Statistics in Ecotoxicology, Wiley, New York, [ISBN: 047196851X].</p> <p>F. Moriarty. (1999), Ecotoxicology: The Study of Pollutants in Ecosystems, 3rd. Academic Press, London, [ISBN: 0125067631].</p> <p>Rachel L. Carson. (2002), Silent Spring, Mariner Book Houghton Mifflin Company, Boston, [ISBN: 0618-24906-05].</p>
<i>This module does not have any article/paper resources</i>
<i>This module does not have any other resources</i>