

BI5108: Green Lab Principles and Practice

Module Details					
Title Short:	Green Lab Principles and Practice APPROVED				
Language of Instruction:	English				
Module Code:	BI5108				
ECTS Credits:	5				
NFQ Level:	9	EQF Level:	7	EHEA Level:	Second Cycle
Valid From:	2020-21 (01-09-20 – 31-08-21)				
Teaching Period:	Semester 1 and Semester 2				
Module Delivered in	22 programme(s)				
Module Owner:	UNA FITZGERALD				
Module Discipline:	ENGINEERING - College of Engineering & Informatics				
Acknowledgment:	This module was developed by Dr Una FitzGerald, Dr Gesche Kindermann, Dr Caitriona Carlin and Dr Iain MacLaren				
Source:	Source material will include textbooks and online resources. For example, the 12 principles of green lab chemistry (online); resources at MyGreenLab.org; climateoutreach.com; EPA; IPCC; UNPCC; Openstax;				
Module Level:	Continuous Calculator (M.Sc.) (PG Dip)				
Module Data:	1 - 4 NON LAB				
Module Description:	This module aims to provide a general overview of key environmental concepts such as climate change, plastic pollution, sustainability, and biodiversity. It will briefly explore how perspectives from psychology, sociology, economics, and the study of ethics and governance provide us with insights into how perception and behaviour influence responses to environmental issues. In addition, the lifecycle of materials, and the environmental impact of the resources and equipment typically used in scientific laboratories will be examined in some detail. These ideas will form the backdrop to a focused study on how the organisation of, and practices in, scientific laboratories can be reformed to reduce their environmental footprint and be established on a more sustainable basis.				
Learning Outcomes					
<i>On successful completion of this module the learner will be able to:</i>					
LO1	Describe the main components of the Earth's climate system, the key factors that influence climate change.				
LO2	Summarise psychological and social influences on your own and others' behaviour in response to learning about climate change, biodiversity loss, and other environmental challenges.				
LO3	List and describe the core principles of sustainability (including sustainability metrics) and indicate which planetary boundaries are currently exceeded.				
LO4	Report on how your local/regional environment is, or is expected to be, impacted by climate change and identify relevant government or supranational (eg. E.U.) policies that address climate change, greenhouse gas emissions and loss of biodiversity.				
LO5	Provide the chemical formula for at least four different kinds of plastic that are commonly used in labs and describe their potential 'cradle-to-grave' impact on the environment.				
LO6	Provide examples of circular economy policies and practice that are being implemented within and outside the EU and cite possible limitations to the CE business model.				
LO7	Advise on the adoption of green practices within research and teaching laboratories in higher education.				

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Module Content & Assessment

Indicative Content

Online resources

www.mygreenlab.org

Climate Communication

Resource produced by Climate Change communicator and sociologist George Marshall.

Online resources

<https://www.climatepsychologyalliance.org/> Excellent resource covering range of topics relating to Climate Psychology; Handbook is free to download.

Online resource

Friends of the Irish Environment <https://www.friendsoftheirishenvironment.org/aboutus>

Online resource

NUIG's sustainability strategy http://www.nuigalway.ie/media/researchcentres/sustainability/uploads/NUIG_-_Sustainability_Strategy_v4.pdf

Online resource

How Ireland manages its waste <https://www.mywaste.ie/>

Online information

The Irish Environmental Network <https://ien.ie/>

Online resource - Biodiversity

Irish pollinator plan <https://pollinators.ie/>

Online

UN Sustainable Development Goals <https://sustainabledevelopment.un.org/?menu=1300>

Carbon footprint calculation

World Wildlife Fund website <https://footprint.wwf.org.uk/#/>

Online

Labconscious - sponsored by New England Biolabs. Useful source of info on green lab activities in the US; examples of good practices and initiatives on-campus <http://www.labconscious.com>

Online

EU strategy on plastic waste: https://ec.europa.eu/commission/news/first-ever-europe-wide-strategy-plastics-2018-jan-16_en

Online resource

The Ellen McArthur Foundation <https://www.ellenmacarthurfoundation.org/>

Online

Climate Interactive (simulation) <https://www.climateinteractive.org/>

No Written Assessment

No Continuous Assessment

No Oral, Audio Visual or Practical Assessment

Department-based Assessment										
Assessment Type	Assessment Description	Outcome addressed	% of total	Marks Out of	Pass Marks	Sitting	Assessment Period	Assessment Date	Duration	Mandatory
Online Assessment 1	Students will take 5 online quizzes worth 10 % each, which will be taken via Bb. Quiz topics are: 1. The Atmosphere and Climate. 2. The Psychology & Sociology of Climate Change and Climate Change Communication. 3. Sustainability. 4. Biodiversity, Environmental Ethics, Leadership and Governance. 5. Plastics & The Circular Economy.	1,2,3,4,5,6	50	100	20	First Sitting	Semester 1	n/a	0	True
Online Assessment 2	Repeat quiz, if required. Timing is at the discretion of the quiz topic lead.	1,2,3,4,5,6	100	100	40	Second Sitting	Autumn	n/a	0	True

Research										
Assessment Type	Assessment Description	Outcome addressed	% of total	Marks Out of	Pass Marks	Sitting	Assessment Period	Assessment Date	Duration	Mandatory
Dissertation	Students will engage with a nominated laboratory, providing a summary of current practices as well as a roadmap to green lab certification. For those who are not based in a laboratory, an alternative assignment will be negotiated with the module director.	7	50	100	20	First Sitting	Summer	n/a	0	True

No Study Abroad

No Computer-based Assessment

The institute reserves the right to alter the nature and timings of assessment

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Module Workload					
Workload: Full Time					
<i>Workload Type</i>	<i>WorkLoad Description</i>	<i>Learning Outcomes</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecturer-Supervised Learning (Contact)	Nine 2-hour lectures and one 4-hour session.	1,2,3,4,5,6	25	Per Semester	2.08
Independent & Directed Learning (Non-contact)	In collaboration with nominated lab, students will prepare summary report of current practices and will propose strategy for green lab certification. For those not engaged in lab activities, an alternative assignment activity will be agreed with the module owner(s).	7	60	Per Semester	5.00
Directed Learning	Studying for five online-quizzes. Three hours per week.	1,2,3,4,5	30	Per Semester	2.50
Total Hours					115.00
Total Weekly Learner Workload					9.58
Total Weekly Contact Hours					2.08
This module has no Part Time workload.					

Module Resources

Supplementary Book Resources

Peter Jacques 2014, *Sustainability: the basics*, 1 Ed., All, Routledge US [ISBN: 978-04156084]

George Marshall 2015, *Don't even think about it: why our brains are wired to ignore climate change*, 1 Ed., All, Bloomsbury USA [ISBN: 978-163286102]

E.O. Wilson 2017, *Half-Earth: Our planet's fight for life*, 1 Ed., All, Liveright UK [ISBN: 978-163149252]

Naomi Klein 2019, *On Fire: the burning question of the green new deal*, 1 Ed., All, Simon & Schuster [ISBN: 978-198212991]

Naomi Klein 2015, *This changes everything: capitalism v the climate*, 1 Ed., All, Simon & Schuster USA [ISBN: 978-145169739]

George Monbiot 2018, *Out of the wreckage: a new politics for an age of crisis*, 1 Ed., All, Verso UK [ISBN: 978-178663289]

This module does not have any article/paper resources

This module does not have any other resources

Module Full Time Equivalent

Module Full Time Equivalent	
<i>Discipline</i>	<i>%</i>
Biomedical Engineering	75
XXX ENVIRONMENTAL SCIENCE	25

Module Delivered in

Course Stream Code	Course Stream Title
AST1	AST1 MSc (AgriFood Sustainability & Technology) (Approved)
CIT1	CIT1 Master of Science (Cheminformatics and Toxicology) (Approved)
CIT8	CIT8 Postgraduate Certificate in Science (Cheminformatics and Toxicology) (Approved)
CIT9	CIT9 Postgraduate Diploma in Science (Cheminformatics and Toxicology) (Approved)
EVL1	EVL1 MSc (Environmental Leadership) (Approved)
MBC1	MBC1 M.Sc. in Biomedical Science (Approved)
MBC1	MBC1 M.Sc. in Biomedical Science (Draft)
MEB1	MEB1 Master of Engineering in Biomedical Engineering (Approved)
MFR1	MFR1 MSc in Marine and Freshwater Resources: Management (Approved)
MSR1	MSR1 Master of Science (Regenerative Medicine) (Approved)
MSR9	MSR9 Postgraduate Diploma in Science (Regenerative Medicine) (Approved)
MST1	MST1 Master of Science (Toxicology) (Approved)
MT1	MT1 Master of Science (Biotechnology) (Draft)
MT1	MT1 Master of Science (Biotechnology) (Approved)
	MV1 Master of Science (Biomedical Science) (Draft)
MVD1	MVD1 Postgraduate Diploma in Biomedical Science (Draft)
SEV1	SEV1 M.Sc. (Sustainable Environments) (Approved)
SPD1	SPD1 Structured Ph.D (Medicine) (Approved)
SPD2	SPD2 Structured Ph.D (Medicine) P/T (Approved)
SPE1	SPE1 Structured PhD (Engineering) (Approved)
SPE2	SPE2 Structured PhD (Engineering) part time (Approved)
SPS1	SPS1 Structured Ph.D. (Science) (Approved)

Module Instructors

Module Instructors	
<i>Staff Member</i>	<i>Staff Email</i>
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