Module Descriptor Form

Civil and Environmental Engineering

CL328 - Environmental Engineering

Module Code	CL328	**Module Title**	Environmental Engineering				
Module Registrar	Switzer, Dr Christine						
Other Staff Involved							
Credit Weighting	10	**Semester**	1	**Elective**	No	**Academic Level**	3
Pre-requisites							
Required for							

Module Format and Delivery (hours):

Lectures	Tutorials	Assignments	Labs	Private Study	Total
0	0	0	0	0	0

Educational Aim

This module aims to:

In its Charter for Sustainable Development, the Institution of Civil Engineers mandates that “sustainable development is central to civil engineering,” and that the profession must “protect and enhance the environment and use resources in a way that does not disadvantage future generations.” Environmental engineers work at the interfaces between the built and natural environments, linking fundamental science and engineering to address complex problems. This class aims to provide an overview of how to apply engineering principles to mitigate, adapt to, or prevent human effects on the environment.

Syllabus

This module will teach the following:

1: Introduction to Environmental Science and Engineering
2: Environmental Chemistry
3: Environmental Biology
4: Mass and Energy Balances in Environmental Systems
5: Mass and Energy Balances in Environmental Systems
6: Environmental and Climate Justice
7: Environmental Impact Assessment
8: Strategic Environmental Assessment
9: Environmental Engineering and the Circular Economy

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Learning Outcomes

On Completion of the module, the student is expected to be able to:

LO: 1	recognise the interplay between engineering and the environment (especially their consequential impacts and risks on each other).
LO: 2	use fundamental scientific and engineering principles to develop representations of environmental systems
LO: 3	understand the interfaces between the built environment and human and environmental health
LO: 4	demonstrate a working knowledge of environmental impact assessment, mitigation strategies, and enhancement

(UK SPEC suggests no more than 4 learning outcomes per module. Statements must be broad and be syllabus free and link in with the intended learning outcomes on the programme specifications.)

Assessment of Learning Outcomes - Criteria

Learning Outcome: **1**

	Criteria
1	identify the interactions between infrastructure development and environmental impacts
2	understand key scientific principles affecting environmental systems

Learning Outcome: **2**

	Criteria
1	identify key mass and energy balances governing environmental systems
2	identify key assumptions that affect these systems and potential simplifications
3	evaluate representations of these systems using mathematical techniques
4	determine the effects of uncertainty on these systems and mathematical solutions

Learning Outcome: **3**

	Criteria
1	identify engineering solutions to complex environmental problems
2	determine key specifications that must be met in developed solutions
3	apply engineering judgment to evaluate proposed solutions

Learning Outcome: **4**

	Criteria
1	identify potential environmental impacts (positive and negative) associated with development
2	apply the precautionary principle in evaluating impacts
3	develop mitigation and enhancement strategies for impacts that can support development when appropriate
4	identify situations, perhaps because mitigation is insufficient, where development is inappropriate

Assessment Method(s) Including Percentage Breakdown and Duration of Exams

To Pass the module, students need to gain a summative mark of: 40%

Description	Semester	Start Week	Duration	Weight	Submission Week	Linked Criteria
Quiz 1	1	3		5%	4	
Quiz 2	1	5		5%	6	
Building Deterioration Lab	1	4		10%	7	
Quiz 3	1	7		5%	8	
Environmental Impact Assessment Project	1	7		25%	10	
Final Exam. Closed Book	1		3.00	50%	E	

Principles of Assessment Feedback

Assessment and feedback practices promote student learning

- Multiple, diverse assessments are utilised to guide student learning.
- General (class-wide) and individual assessments will be provided via MyPlace.
- Small, formative assessments, some of which are for credit, will provide rapid feedback to students.
- Feedback on substantial written assessments will be provided within three weeks of submission, as per Departmental policy.

Assessment and feedback practices are appropriate, fair and transparent

- Professional-quality report writing and conduct are expected in assignments.
- Assessment criteria and rubrics will be provided in advance of assignments.
- Feedback will be accessible via Myplace and, in most cases, will be based on pre-determined rubrics.
- Assessment and feedback practices are clearly communicated to students and staff .
- Course syllabus will be provided to all students before the first day of class with assignment deadlines indicated.
- Clarifications and further feedback are possible via individual meeting upon request.

Assessment weighting and lecture order

- Rubrics will be provided for assignments.
- Class structure includes both lecture and tutorial.

Assessment and feedback practices are continuously reviewed

- Students will have opportunities to evaluate the course (mid- and final-semester)
- Responses to evaluations (esp. mid-term) will be provided by the class registrar
- Assessments, feedback and course evaluations are reviewed by external examiner, examination boards, and accreditation reviews.
- Class performance is also reviewed via online surveys at the end of each academic year.

Additional Information

Resit Procedure

Examination or coursework during the summer resit period

Recommended Reading

Davis M. & S. Masten (2014) Principles of Environmental Engineering and Science. McGraw Hill, 3rd Edition (ISBN 9781259060472)

MacKay DJC (2009) Sustainable Energy without the Hot Air.

Module Timetable

Week	Semester 1	Semester 2
0		
1		
2		
3		
4	Submission 5%	
5		
6	Submission 5%	
7	Lab 10%	
8	Submission 5%	
9		
10	Submission 25%	
11		
E	Examination 50%	

Date of Last Modification

11-09-2025