MODULE DESCRIPTOR 2019/20

CL431 / EV908:

Pollution & Rehabilitation of Degraded Ecosystems

Registrar: Dr. Charles W. Knapp	**Taught To (Programme):** CL431: MEng/BEng Civil & Environmental Engineering EV908: all MSc	
Other Lecturers Involved: Dr Christine Switzer	**Credit Weighting:** 10	**Semester:** On campus: 1 Online learning: 1
Assumed Pre-requisites: none	**Optional:** all programmes	**Academic Level:** 4-5

Class Format and Delivery (hours):

Lecture	Tutorial	Laboratory	Coursework	Project	Private Study	**Total**
12	2	6	30	10	40	100

Class Aim(s)

This class aims to:

- Introduce student to ecological principles (organism, population, community, and ecosystem levels)
- Introduce students to the impacts of various forms of pollution on ecosystems
- Identify options available for monitoring pollution impacts
- Evaluate remediate alternatives, recovery management, or ways to enhance environmental systems.

Learning Outcomes

On completion of the class the student is expected to be able to

1. Explain the impacts of diverse types of pollution on major ecosystem types;
2. Discuss critically various remediation and restoration techniques;
3. Evaluate management options for ecosystem recovery and enhancement;
4. Understanding how ecological principles can be incorporated with a range of decision making processes

Syllabus

The course will teach the following, week:

1. Marine systems + plastics in the environment
2. (bank holiday)
3. Field work
4. Laboratory work
5. Soil systems
6. Freshwater systems
7. Principles of ecology 1
8. Principles of ecology 2
9. Ecological modelling (“pilot lecture”)
10. Presentation workshop (tutorial for submissions)
11. Presentation discussion and feedback (incl. preparations for exam)

Assessment Criteria

For each of the Course Learning Outcomes the following criteria will be used to make judgements on student learning:

LO1: Explain the impacts of diverse types of pollution on major ecosystem types;
C1 Marine pollution report: the report on the field and laboratory exercise encourages deep learning about marine pollution
C2 Quiz: online quiz
C3 Exam: The impacts of ecosystem disturbances will be assessed in case study style questions in the exam

LO2: Discuss critically various remediation and restoration techniques;
C1 Marine pollution report: how to address existing pollution is an important aspect of the assessment criteria
C2 Presentation
C3 Exam: Mitigation and/or restoration of ecosystem disturbances will be assessed in case study style questions in the exam

LO3: Evaluate management options for ecosystem recovery and enhancement;
C1 Marine pollution report (formative): as part of the assessment, students are encouraged to think about potential interventions and their impacts
C2 Presentation
C3 Exam: Management strategies for ecosystem recovery and enhancement will be assessed in case study style questions in the exam

LO4: Understanding how ecological principles can be incorporated with a range of decision making processes
C1 Marine pollution report (formative): field and laboratory work are used to frame ecosystem impacts
C2 Presentation
C3 Exam: Assessed in case study style exam questions

The standards set for each criterion per Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessments.

Principles of Assessment and Feedback (https://www.strath.ac.uk/staff/policies/academic/)

Please state briefly how these are incorporated in this module.

PRINCIPLE 1. ASSESSMENT AND FEEDBACK PRACTICES PROMOTE EFFECTIVE STUDENT LEARNING
Assessment and feedback structure and timing is designed to support students' learning. Assessments are distributed through the semester to engage students throughout the course.

PRINCIPLE 2. ASSESSMENT AND FEEDBACK PRACTICES ARE APPROPRIATE, FAIR, AND TRANSPARENT
Assessment criteria are published to students and staff in assignment instructions. Answers to students' questions about assignment instructions are published to all students when necessary.

PRINCIPLE 3. ASSESSMENT AND FEEDBACK PRACTICES ARE CLEARLY COMMUNICATED TO STUDENTS AND STAFF
Course descriptor is published to all staff and students at the start of term.

PRINCIPLE 4. ASSESSMENT AND FEEDBACK PRACTICES ARE CONTINUOUSLY REVIEWED
Assessment and feedback practices are reviewed in midterm and end of term surveys.

Recommended Reading

Principles of Ecology:
Ecology : from individuals to ecosystems
Michael Begon; Colin R Townsend; John L Harper; Dawsonera
4th ed. Malden, MA : Blackwell Pub. 2006

Ecological modelling:
https://cbs.umn.edu/populus/download-populus

PLEASE NOTE:
Students need to gain a summative mark of 40% (CL431) / 50% (EV908) to pass the module.

Resit Arrangements

Resits will comprise of either assessments or exam (or both) as required to obtain passing marks. Arrangements and requirements will be discussed with class registrar after June examinations board.

Re-examinations for on-campus students will be during the August diet as scheduled by the university. Re-sits for online-Learning students will be arranged following the September examinations board.

Approved

Programme Director Signature:	Charles W. Knapp
Date of Last Modifications:	25 July 2019

Assessment and Feedback Schedule

Class Code	CL431 / EV908	Class Title	Pollution & Rehabilitation of Degraded Ecosystems

Brief Description of Assessment

HW #1, field report (25%)
HW #2, online ecology quiz (10%)
HW #3, online presentation (25%)
Final examination (40%)

Indicate in the tables below the Hand-Out (H), Submission (S) and Feedback (F) dates for each lab report/coursework/project and the timing of each Exam/Class Test (E), (T). Include duration of exam in brackets (e.g. E (2)).

Semester 1

Assessment type (& title)	LOs	Weight (%)	Individual / Group	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
Field report	1-3	25%	Group	(H)					(S)		(F)				
Online quiz	1	10%	Individual								(H)(S)(F)				
Presentation	2-4	25%	Group	(H)					(pre-S)	(pre-F)			(H)	(F)	
Exam	1-4	40%	Individual												(E)

Mapping Module Learning Outcomes to AHEP

Module Learning Outcome	Engineering Council AHEP competencies: Knowledge, Understanding and Ability
LO1: Explain the impacts of diverse types of pollution on major ecosystem types	• Maths & Science: A comprehensive knowledge and understanding of scientific principles and methodology necessary to underpin their education in their engineering discipline, and an understanding and know-how of the scientific principles of related disciplines, to enable appreciation of the scientific and engineering context, and to support their understanding of relevant historical, current and future developments and technologies • ELSEE: Understanding of the requirement for engineering activities to promote sustainable development and ability to apply quantitative techniques where appropriate
LO2: Discuss critically various remediation and restoration techniques	• Maths & Science: Awareness of developing technologies related to own specialisation • Engineering analysis: Ability to use fundamental knowledge to investigate new and emerging technologies
LO3: Evaluate management options for ecosystem recovery and enhancement	• Engineering analysis: Ability to identify, classify and describe the performance of systems and components through the use of analytical methods and modelling techniques • Design: Investigate and define the problem, identifying any constraints including environmental and sustainability limitations; ethical, health, safety, security and risk issues; intellectual property; codes of practice and standards • Design: Communicate their work to technical and non-technical audiences • ELSEE: Knowledge and understanding of management techniques, including project and change management, that may be used to achieve engineering objectives, their limitations and how they may be applied appropriately
LO4: Understanding how ecological principles can be incorporated with a range of decision making processes	• Maths & Science: A comprehensive knowledge and understanding of mathematical and computational models relevant to the engineering discipline, and an appreciation of their limitations • Engineering analysis: Understanding of, and the ability to apply, an integrated or systems approach to solving complex engineering problems

JBM Programme Threads

Thread	Primary	Secondary	Contributory
Design			
Health, Safety & Risk Assessment		LO1 – LO2 (fieldwork)	
Sustainability	LO 1-4 (Presentation, quiz)		
Maths for Engineers			"Pilot lecture" – ecological modelling Quantitative analysis of field and laboratory data
Industrial Engagement			Field and laboratory work have industrial relevance
Digital Technologies		Online presentation	Qualitative analysis of field and laboratory work "Pilot lecture" – ecological modelling