CLASS/MODULE DESCRIPTOR 2021/22

EV921 Water & Environmental Management

Registrar: Dr T K Beattie	**Taught To (Programme): MSs courses in Dept of Civil & Environmental Engineering**	
Other Lecturers Involved:	**Credit Weighting: 10**	**Semester: 1**
Assumed Pre-requisites:	**Compulsory/ optional/**	**Academic Level: 5**

Class Format and Delivery (hours):

Lecture	Tutorial	Laboratory	Coursework	Project	Private Study	**Total**
18	2		24		56	100

Class Aim(s)

This course aims to provide an insight into water quality, water quality objectives and pollution control strategy, and introduce the design and control of water and wastewater treatment processes.

Learning Outcomes

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

LO1 Understand the properties of surface water and how alterations to these, e.g. due to pollution events, can have an impact on water quality, biodiversity and human health

LO2 Discuss the impact of legislation on surface water quality

LO3 Discuss collection and treatment of community wastewater

LO4 Discuss treatment and provision of drinking water

Syllabus

The class will teach the following:

Physical and chemical characteristics of water and wastewater, including BOD, COD, alkalinity, hardness, colour, turbidity, Fe, trihalomethanes.
Microbial quality of water and its measurement
Surface water and disease transmission
Effects of principal pollutants on the water ecosystem.
Marine, coastal, estuarine pollution issues and control, objectives in out-fall design, bathing beaches, shell fisheries.
River pollution, oxygen sag curve.
Pollution of lakes and reservoirs, eutrophication, thermal stratification
Review of sources of pollution control strategy on the basis of Environmental Quality Objective, Best Practical Environmental Option, Environmental Quality Standard.
Demand for water and production of wastewater.
Introduction to wastewater treatment: characteristics and quality.
Overview of sewage works design: preliminary processes including screens and grit removal, sedimentation, activated sludge design, sludge treatment and disposal.
Water Treatment: Review of water types and water quality objectives, overview of water treatment works design, coagulation, flocculation, filtration.

Assessment Criteria

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

LO1 Understand the properties of surface water and how alterations to these, e.g. due to pollution events, can have an impact on water quality, biodiversity and human health
C1 familiarity with physical, chemical and biological properties of surface waters, and the influence they have on water quality
C2 familiarity with major water pollutants and the effect they have on surface water quality

LO2 Discuss the impact of legislation on surface water quality
C1 familiarity with the influence and impact of various EU directives on national legislation and the provision of national water quality standards for wastewater, surface, bathing and drinking water
C2 have an understanding of pollution control strategies utilising water quality standards and objectives as defined by National/EU regulation

LO3 Discuss collection and treatment of community wastewater
C1 familiarity with wastewater collection systems
C2 have an awareness of wastewater treatment processes and the overall design of sewage works, including the design of settling tanks, activated sludge and sludge treatment

LO4 Discuss treatment and provision of drinking water
C1 familiarity with plant processing for provision of drinking water from raw sources through to delivery of drinking water to the consumer
C2 have an awareness of water treatment including water types, water quality objectives, the processes of coagulation and flocculation and the design of filtration systems

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.

Information issued at start of Semester includes simple & clear guidance on the overall assessment load throughout the Semester. Expectations in terms of time and effort are outlined clearly in the presentation of each assignment. These expectations are communicated clearly in class. Weightings for each assignment underscore the time expectations.

Students are given opportunities to engage in optional assessments using carefully managed mechanisms of only counting the contribution of this work if these marks are in the student's favour. This encourages more able students to try to achieve higher overall marks by taking their learning to a more advanced level, while at the same time avoiding overly penalising overloaded and/or less-able students who may be overwhelmed by the additional workload.

Criterion based feedback to students is an integral part of teaching. This is collated into 'generic' feedback that is shared with the whole class, to complement individual feedback for each student. The generic feedback is particularly useful inasmuch as any common or recurring difficulties experienced by many in the class could suggest ways in which teaching and guidance could be improved. The individual feedback is directed at how each student can improve, in all cases avoiding comparisons between students. Feedback sheets provide information allowing students to compare their work to the expectations for each assignment and reflect on improvements for future work.

Information issued at the start of the class, includes simple & clear guidance on performance criteria by reference to the University Guidance on Marking for Undergraduate Courses*. Reference is made to equivalent p/g marking schemes in MSc handbooks. Marking criteria are outlined clearly in the assignment handout and multiple opportunities for clarification are available in class. Feedback sheets demonstrate what constitutes "excellent" work.

*Guidance on Marking for Undergraduate Courses: https://www.strath.ac.uk/staff/policies/academic/

The course includes some assessment scenarios where creativity and ability to solve open-ended problems are valued. In such scenarios tightly specified goals or outcomes in advance may be inappropriate. Instead students are guided about the nature of the assignment and actively engaged in making their own judgements about what would constitute quality.

Recommended Reading

The course was developed around the following text books – however any water quality text book will be suitable for background reading.

Tebbutt, THY. Principles of Water Quality Control. Pergamon (5th Ed) 1998, ISBN 0 7506 3658 0.
Gray, NF. Water Technology: an introduction for environmental scientists and engineers. Elsevier (2nd Ed.) 2005, ISBN0750666331
Ellis, KV; Warn, AE & White, G. Surface Water Pollution & its Control. MacMillan ISBN 0 333 427645.
Harrison, RH. Pollution: Causes, Effects & Control. (4rd Ed) 2001 , Royal Society of Chemistry.

Water research papers on MyPlace

PLEASE NOTE:
Students need to gain a summative mark of 50% to pass the module. Students who fail the module at the first attempt will be re-examined during the August diet. This re-examination will consist entirely of an exam or coursework.

Resit Arrangements

The class registrar will inform the student of the details of the resit assessment after the June exam board. The resit will either be an exam during the August exam diet or a coursework due for submission in August; the submission will be worth 100% of the resit mark.

Approved

Programme Director Signature: Tara K. Beattie
Date of Last Modifications: September 2021

(Updated 9th August 2018)

Assessment and Feedback Schedule

Class Code	EV921	Class Title	Water and Environmental Management

Brief Description of Assessment

Class test (30%) – review questions on material covered to date Optional Water pollution assignment (15%)– water pollution poster Examination (55% or 70%) – 1st Diet Exam in December where students are required to answer three out of five questions in an exam paper

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
Class test	1, 2	30%	Individual							E (1)			F		
Poster	1, 2	15%	Individual				H				S				F
Exam	1-4	55%	Individual												E (2)

Semester 2

Assessment type (& title)	LOs	Weight (%)	Individual / Group	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period

JBM/Programme Threads

Thread	Primary	Secondary	Contributory
Design	Major component of class LO3 & 4.		
Health, Safety & Risk Assessment		Minor component of class LO1&2	
Sustainability	Major component of course LO1&2.		
Maths for Engineers			
Industrial Engagement		Minor component of course LO2-4	
Digital Technologies			