

Module Descriptor Form

Civil and Environmental Engineering

CL904 - Waste Management And Landfill Design

Module Code	CL904	Module Title	Waste Management And Landfill Design							
Module Registrar	Beattie, Dr Tara K									
Other Staff Involved										
Credit Weighting	10	Semester	2	Elective	Yes	Academic Level				
Pre-requisites										
Required for										

Module Format and Delivery (hours):

Lectures	Tutorials	Assignments	Labs	Private Study	Total
18	2	20	0	60	100

Educational Aim

This module aims to:

develop a critical understanding of the process involved with management of primarily municipal solid waste, including storage, collection, treatment methods, and ultimately disposal. Students will also gain knowledge of the regulation associated with such wastes, and the roles of the various agencies involved in the processes

Syllabus

This module will teach the following:

Introduction to Solid Waste Management – definition, categorisation (controlled & non-controlled) and arisings
 National Waste Strategy for Scotland and UK and other Regulation pertinent to Solid Waste Management
 Collection, Recycling & Materials Recovery Facilities
 Energy from Waste - incineration, gasification, pyrolysis and refuse derived fuel
 Anaerobic digestion and composting of solid waste
 Landfill – design, operation, waste degradation processes, leachate & gas management
 Solid Waste Management in Developing countries
 Hazardous Waste, Clinical Waste, C & D Waste.

Learning Outcomes

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

LO: 1	Discuss the generation of solid waste
LO: 2	Discuss legislation related to solid waste management
LO: 3	Discuss common methods used in the management and treatment of solid municipal waste

(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	LO1 Discuss the generation of solid waste C1 categorise solid waste as defined by pertinent Scottish/UK/European legislation, and understand why this is an important concept C2 familiarity with solid waste arisings in Scotland & the UK

Learning Outcome: **2**

	Criteria
1	LO2 Discuss legislation related to solid waste management C1 Familiarity with government strategy and the concepts behind development of regulation, i.e. to protect human health and the environment, and be aware of current development within this field of regulation C2 Familiarity with the drivers behind change in the management of such methods

Learning Outcome: **3**

	Criteria
1	LO3 Discuss common methods used in the management and treatment of solid municipal waste C1 familiarity with solid waste collection, sorting and transfer C2 familiarity with recycling, thermal treatment of solid waste (incineration, gasification, pyrolysis), biological treatment of solid waste (anaerobic digestion and composting), landfill as a disposal option, and developing methods

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

To Pass the module, students need to gain a summative mark of: **50%**

Description	Semester	Start Week	Duration	Weight	Submission Week	Linked Criteria
Class test. Closed Book	2		1.00	30%	8	
Optional poster assignment	2	5		15%	11	
Exam. Closed Book	2		2.00	70%	E	

Principles of Assessment Feedback

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.

Additional Information

Resit Procedure

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.

Recommended Reading**For reference**

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

Harrison, RH. Pollution: Causes, Effects & Control. (4rd Ed) 2001, Royal Society of Chemistry.

Waste Disposal & Treatment by Paul T. Williams, 2nd Ed, 2005, published by John Wiley & Sons Ltd D628.445WIL

Wider References

National Waste Strategy – Scotland, England, etc

Netregs <http://www.netregs.gov.uk/netregs/>

SEPA www.sepa.org.uk/

DEFRA www.defra.gov.uk/

Environment Agency www.environment-agency.gov.uk/

Environment Agency guidance for landfill gas management (various guidance documents)

Guidance on monitoring landfill leachate, groundwater and surface water, SEPA 2003

Module Timetable

Week	Semester 1	Semester 2
0		
1		
2		
3		
4		
5		
6		
7		
8		Test 30%
9		
10		
11		Submission 15%
E		Examination 70%

Date of Last Modification

06-11-2025