

SUBJECT TEACHING GUIDE

M2126 - Land-fill Engineering

Master's Degree in Environmental Engineering and Management

Academic year 2022-2023

1. IDENTIFYING DATA					
Degree	Master's Degree in Environmental Engineering and Management			Type and Year	Optional. Year 1
Faculty	School of civil Engineering				
Discipline	ENVIRONMENTAL TECHNOLOGIES				
Course unit title and code	M2126 - Land-fill Engineering				
Number of ECTS credits allocated	3	Term	Semester based (2)		
Web	https://egela.ehu.eus/				
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. CIENCIAS Y TECNICAS DEL AGUA Y DEL MEDIO AMBIENTE				
Name of lecturer	AMAYA LOBO GARCIA DE CORTAZAR				
E-mail	amaya.lobo@unican.es				
Office	E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 2. DESPACHO (2028)				
Other lecturers	ANA LOPEZ MARTINEZ				

3.1 LEARNING OUTCOMES
- Applying the standards regarding solid waste landfills.
- Discussing, selecting and defining adequate technical alternatives for landfill design, operation and monitoring.
- Developing water balances in a landfill with different accuracies and discussing each method.
- Estimating landfill gas generation with different accuracies and discussing the estimation methods.
- Describing at a basic level the main geotechnical processes in a landfill, indentifying the principle variables.
- Applying simulation models as a tool for landfill design, operation and monitoring.
- Analyzing and discussing an specific novel topic in the field of landfill engineering.

4. OBJECTIVES

Describing, identifying the principal variables and parameters, and modelling landfill hydrological, biochemical and geotechnical processes.
Selecting and designing elements for environmental protection in a landfill.
Diagnosing a landfill and proposing improvements for its design, operation and monitoring.
Describing new trends in different areas of landfill engineering.
Applying design and simulation models as a tool for the objectives mentioned above.

6. COURSE ORGANIZATION

CONTENTS	
1	INTRODUCTION. Introduction. Standards. Site selection. Preparing the landfill vessel.
2	WATER BALANCE. LEACHATE COLLECTION.
3	LEACHATE TREATMENT. SURFACE RUNOFF
4	LANDFILL GAS
5	OPERATION, MONITORING AND CLOSURE
6	LANDFILL MODELLING

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Questionnaires	Written exam	No	Yes	30,00
Practical cases	Work	No	Yes	40,00
Computer practices	Laboratory evaluation	No	Yes	10,00
Course work	Work	No	Yes	10,00
Technical visit report	Others	No	Yes	10,00
TOTAL				100,00
Observations				
Observations for part-time students				
The assessment of part-time students will include all the assessment activities set.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Tchobanoglous, George y Kreith, Frank (2002) Handbook of solid waste management. McGraw Hill, Nueva York, EE.UU.
Grupo de Ingeniería Ambiental. Universidad de Cantabria (2010) MODUELO 4.0 Manual de usuario.
Fundación Labein (2005) Guía Técnica para la Medición, Estimación y Cálculo de las Emisiones al Aire. Sector Gestión de Residuos. 8. IHOBE- Sociedad Pública de Gestión Ambiental.
IHOBE (2015) Documento Guía para la Realización de Balances Hídricos en Vertederos. Gobierno Vasco. Departamento de Medio Ambiente y Política Territorial
Normativa específica sobre vertederos en España y Europa

