

SUBJECT TEACHING GUIDE

G796 - Waste Management

Degree in Chemical Engineering First Degree in Chemical Engineering

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Degree in Chemical Engineering First Degree in Chemical Engineering			Type and Year	Optional. Year 4 Optional. Year 4
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Option B: Industrial Environmental Management Optional Module				
Course unit title and code	G796 - Waste Management				
Number of ECTS credits allocated	6	Term	Semester based (1)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. DE QUIMICA E INGENIERIA DE PROCESOS Y RECURSOS.				
Name of lecturer	ANA MARIA ANDRES PAYAN				
E-mail	ana.andres@unican.es				
Office	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 3. DESPACHO (S3012)				
Other lecturers	EVA CIFRIAN BEMPOSTA				

3.1 LEARNING OUTCOMES

- Being able to analyze the basic aspects of waste characterization; of different treatment for removing the pollution load of industrial waste; and clean technologies in the framework of industrial sector.
- Solve problems related to characterization, treatment and waste management in the industrial sector.

4. OBJECTIVES

- Characterization and classification of waste.
- Introduce the concept of Circular Economy
- Analysis of the processes of industrial waste treatment.
- Analyze the decision making on the management of industrial waste
- Perform synthesis, analysis and evaluation of alternative waste minimization and valorisation.
- Application of Circulation Strategies to reduce the generation of waste.

6. SUBJECT PROGRAM

CONTENTS	
1	SECTION 1. CHARACTERIZATION AND CLASSIFICATION OF WASTE Item 1. CONCEPT OF CIRCULAR ECONOMY. Item 2. ACTIVITIES GENERATING SOLID WASTE. Item 3. CHARACTERIZATION OF SOLID WASTE POLLUTION. Item 4. LEGISLATION ON SOLID WASTE.
2	SECTION 2. WASTE TREATMENT PROCESS Item 5. PROCESS OF PRE-WASTE TREATMENT Item 6. PHYSICAL TREATMENT PROCESSES. Item 7. CHEMICAL TREATMENT PROCESSES Item 8. BIOLOGICAL TREATMENT PROCESSES Item 9. WASTE INCINERATION Item 10. SOLIDIFICATION/STABILIZATION TECHNOLOGIES Item 11. WASTE DISPOSAL
3	SECTION 3. ALTERNATIVE TECHNOLOGIES OF WASTE MANAGEMENT TO PROMOTE THE CIRCULAR ECONOMY Item 12. TECHNOLOGICAL ALTERNATIVES: CLEAN PRODUCTION Item 13. TECHNOLOGICAL ALTERNATIVES: MINIMISATION
4	SECTION 4. APPLICATION OF CIRCULAR ECONOMY STRATEGIES for REDUCING WASTE GENERATION Item 14: CIRCULATION STRATEGIES Item 15. PRACTICAL CASES OF CIRCULAR ECONOMY IN THE INDUSTRIAL SECTOR

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Group Work Date of completion: Throughout the course. Recovery conditions: In ordinary/extraordinary call	Work	No	Yes	40,00
Written exam Date of completion: At the end of the teaching of Block II Recovery conditions: In ordinary/extraordinary call	Written exam	No	Yes	60,00
TOTAL				100,00
Observations				
Continuous assessment involves the obligation of the student attendance at classes.				
Observations for part-time students				
The final assessment for part-time students will be a percentage weight of 60% in the final assessment of the subject. And the evaluation of four individual work associated with each of the blocks allocated along the course, it will mean the remaining 40% of the final assessment.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

- Elias, X. Ed., Reciclaje de Residuos Industriales, Díaz de Santos, Barcelona, 2009.
- Rodriguez, J.J., Irabien, A. (Eds.), Los Residuos Peligrosos: Caracterización, tratamiento y gestión, Síntesis, Madrid, 2013.
- Guyer, H.H., Industrial Processes and Waste Stream Management, John Wiley & Sons, Inc., New York, 1998.
- Freeman, H.M., Harris, E.F. (Eds.), Hazardous Waste Remediation. Innovative Treatment Technologies, Technomic, Lancaster, 1995.
- Wang, L.K., Hung Y, Lo, H.H., Yapijakis, C. (Eds.), Handbook of Industrial and Hazardous Wastes Treatment, Marcel Dekker, Inc, New York, 2004.
- Serrano, F., Bruzzi, L. (Eds.), Gestión Sostenible del Ambiente: Principios, contexto y métodos, Universidad de Granada, 2012.