SUBJECT TEACHING GUIDE

G795 - Wastewater Treatment

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 Subject Area: Option D: European Project Semester Optional Module			
Course unit title and code	G795 - Wastewater Treatment			
Number of ECTS credits allocated	6	Term	Semester based (2)	
Web				
Language of instruction	English	Mode of delivery	Face-to-face	

Department	DPTO. INGENIERIAS QUIMICA Y BIOMOLECULAR
Name of lecturer	RAQUEL IBAÑEZ MENDIZABAL
E-mail	raquel.ibanez@unican.es
Office	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 2. DESPACHO RAQUEL IBAÑEZ MENDIZABAL (S2015)
Other lecturers	GERMAN SANTOS BREGEL MARCOS FALLANZA TORICES GUILLERMO DIAZ SAINZ

3.1 LEARNING OUTCOMES

- conceptualize regulatory parameters regarding urban and industrial wastewaters characterization and management
  Conceptualize Conventional wastewater treatment processes
  Conceptualize Advanced wastewater treatment processes
  Discriminate alternatives for wastewater treatment using sustainability criteria

4. OBJECTIVES

At the end of the semester the student should be able to:
conceptualize regulatory parameters regarding urban and industrial wastewaters characterization and management.
Conceptualize Conventional wastewater treatment processes
Conceptualize Advanced wastewater treatment processes
Discriminate alternatives for wastewater treatment using sustainability criteria.

6. SUBJECT PROGRAM

CONTENTS	
1	WATER RESOURCES AND MANAGEMENT: Water cycle, characteristics and distribution of water resources, sustainable wastewater management.
2	CONVENTIONAL TECHNOLOGIES FOR WASTE-WATER TREATMENT- PART 1_ PRIMARY TREATMENT: physical treatment systems; chemical treatment systems.
3	CONVENTIONAL TECHNOLOGIES FOR WASTE-WATER TREATMENT- PART 2_ SECONDARY TREATMENT: aerobic biological processes, anaerobic biological processes .
4	ADVANCED TECHNOLOGIES FOR WASTE-WATER TREATMENT tertiary treatment in waste water treatment plants (WWTP). Disinfection, membrane technologies, POAS.
5	SLUDGE MANAGEMENT AND UTILISATION: Treatments for WWTP sludge, sludge conversión, management and utilisation under sustainability criteria.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Test 1	Written exam	No	Yes	38,00
Test 2	Others	No	Yes	30,00
Portfolio	Others	No	Yes	30,00
visit and lectures	Others	No	No	2,00
TOTAL				100,00

Observations

Continuous assessment procedure is based on the execution of test 1 and 2 and the delivery of a portfolio. The portfolio´s content will be also evaluates in the tests.
Those students who do not follow the continuous evaluation procedure will have the option of performing a final exam in the date scheduled by the ETSIIyT (minimum mark 5.0)

Observations for part-time students

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

- Karia G.L. and Christian R.A.; Wastewater Treatment. Concepts and design Approach. Asoke K. Ghosh, PHI Learning Private Limited Second Edition (2015). ISBN:-978-81-203-47365-9.
-Stuetz R., Principles of Water and Wastewater Treatment Processes, in Water and Wastewater Process Technologies Series, (series editor: Tom Stephenson) IWA Publising 2009 Crandfield Univeristy.

-Asano, T. et al, Metcalf & Eddy, Water Reuse. Issues, Technologies and Applications, McGraw-Hill, 2007.
Edwards J.D., Industrial Wastewater Treatment. A Guidebook. 199 CRC Press Inc.
Judd S., The MBR Book. Principles ans Applications of membrnae Bioreactors in Water and Wastewater Treatment. 2006 Elsevier.
-- Degrémont, Water Treatment Handbook, Lavoisier Publishing Inc., Paris, 1991.
- Simon Parsons (Ed.) Advanced oxidation processes for water and wastewater treatment London: IWA, 2004.
- Xie, Yuefeng F. Disinfection byproducts in drinking water: formation, analysis, and control, Lewis Publishers, cop. Boca Raton, 2004.
- K.I Dahm, D. Hanus, M. Semmens.; Membrane technology: an innovative alternative in wastewater treatment, Water Environment Research Foundation, 2000.