

## GUÍA DOCENTE ABREVIADA DE LA ASIGNATURA

G795 - Wastewater Treatment

Grado en Ingeniería Química

Curso Académico 2023-2024

1. DATOS IDENTIFICATIVOS				
Título/s	Grado en Ingeniería Química		Tipología v Curso	Optativa. Curso 4
Centro	Escuela Técnica Superior de Ingenieros Industriales y de Telecomunicación			
Módulo / materia	MATERIA OPCIÓN B: GESTIÓN DEL MEDIO AMBIENTE INDUSTRIAL MATERIA OPCIÓN D: EUROPEAN PROJECT SEMESTER MÓDULO OPTATIVO			
Código y denominación	G795 - Wastewater Treatment			
Créditos ECTS	6	Cuatrimestre	Cuatrimestral (2)	
Web				
Idioma de impartición	Inglés	Forma de impartición	Presencial	

Departamento	DPTO. INGENIERIAS QUIMICA Y BIOMOLECULAR		
Profesor responsable	RAQUEL IBAÑEZ MENDIZABAL		
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Número despacho	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 2. DESPACHO RAQUEL IBAÑEZ MENDIZABAL (S2015)		
Otros profesores	GERMAN SANTOS BREGEL MARCOS FALLANZA TORICES GUILLERMO DIAZ SAINZ		

### 3.1 RESULTADOS DE APRENDIZAJE

- 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. OBJETIVOS

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. ORGANIZACIÓN DOCENTE

##### CONTENIDOS

1	WATER RESOURCES AND MANAGEMENT: Water cycle, characteristics and distribution of water resources, sustainable wastewater management. Introduction to wastewater treatment.
2	CONVENTIONAL TECHNOLOGIES FOR WASTE-WATER TREATMENT- PART 1_ Preliminary and primary treatment: physical treatment systems; chemical treatment systems.
3	CONVENTIONAL TECHNOLOGIES FOR WASTE-WATER TREATMENT- PART 2_ Secondary treatment: aerobic biological processes, nitrogen and phosphorous removal.
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, anaerobic digestión, sludge conversión, management and utilisation under sustainability criteria.

#### 7. MÉTODOS DE LA EVALUACIÓN

Descripción	Tipología	Eval. Final	Recuper.	%
continuous evaluation-Topics developed	Examen escrito	No	Sí	38,00
WWTP design Project	Otros	No	Sí	30,00
Laboratory Portfolio	Otros	No	Sí	30,00
visit and lectures	Otros	No	No	2,00
<b>TOTAL</b>				<b>100,00</b>

##### Observaciones

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).

Evaluation methodologies may be accommodated in the non-face-to-face assessment if necessary.

##### Crterios de evaluación para estudiantes a tiempo parcial

In accordance with article 24 of the REGULATION of the EVALUATION PROCESSES OF THE UNIVERSITY OF CANTABRIA it, the specific procedures that guarantee in each case the evaluation of the same knowledge and competences to be acquired by students full-time will be established in coordination with the student and the coordinator of the degree.

## 8. BIBLIOGRAFÍA Y MATERIALES DIDÁCTICOS

### BÁSICA

- 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 Publishing 2009 Cranfield University.
- 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 and Applications of membrane 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.

Esta es la Guía Docente abreviada de la asignatura. Tienes también publicada en la Web la información más detallada de la asignatura en la Guía Docente Completa.