

SUBJECT TEACHING GUIDE

G787 - Advanced Separation Processes

Degree in Chemical Engineering

Academic year 2023-2024

1. IDENTIFYING DATA			
Degree	Degree in Chemical Engineering	Type and Year	Optional. Year 4
Faculty	School of Industrial Engineering and Telecommunications		
Discipline	Subject Area: Option A: Fundamental Chemical Engineering Subject Area: Option D: European Project Semester Optional Module		
Course unit title and code	G787 - Advanced Separation Processes		
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	EUGENIO BRINGAS ELIZALDE
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3.1 LEARNING OUTCOMES

- Be able to know the fundamentals and applications of rate-controlled separation processes:
 - Membrane-based separation processes
 - Solid-fluid separation processes

4. OBJECTIVES

6. COURSE ORGANIZATION

CONTENTS	
1	1. UNIT 1: Introduction to advanced separation processes 1.1. Introduction 1.2. Definition and classification of advanced separation processes
2	UNIT 2: Case studies of environmental and industrial applications 2.1. Energy sector: CO ₂ capture from flue gases 2.2. Water treatment: Tertiary wastewater treatment 2.3. Food industry: Dairy products processing 2.4. Pharmaceutical industry: Purification of active ingredients and solvent recovery
3	3. UNIT 3. Fluid-solid separation processes 3.1. Adsorption. Fundamentals, design and applications. 3.2. Ion Exchange. Fundamentals, design and applications.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Partial Exams	Written exam	No	Yes	45,00
Portfolio	Others	No	No	10,00
Presentation Practical Sessions	Oral Exam	No	Yes	45,00
TOTAL				100,00
Observations				
Continuous assessment procedure is based on the execution of tests 1 (22,5%) and 2 (22,5%) to evaluate the theoretical contents, a power point presentation to evaluate the practical sessions (45%) and the delivery of a portfolio (10%). The portfolio's content will be also evaluated in tests. The student 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				
Article 24 from Reglamento de los Procesos de Evaluación en la Universidad de Cantabria will be applied				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC
<ul style="list-style-type: none"> - WANKAT, P.C., Rate-Controlled Separations, 1996, Blackie Academic & Professional. - SEADER, J.D., HENLEY, E.J. Separation Process Principles. 2006. 2nd Wiley & Sons. - CUSSLER, E.L., Diffusion. Mass Transfer in Fluid Systems. 2009. 3rd Ed. Cambridge University Press. - DRIOLI, E., CRISCUOLI, A., CURCIO, E., Membrane Contactors: Fundamentals, Applications and Potentialities. 2006. Elsevier. - COULSON, J.M. RICHARDSON, J.F. Chemical Engineering (Particle Technology and Separation Processes). 2002. Oxford; Butterworth Heinemann, 2002

