SUBJECT TEACHING GUIDE

1051 - Emerging Technologies in Chemical Engineering

Master's Degree in chemical engineering

Academic year 2023-2024

1. IDENTIFYING DATA				
Degree	Master's Degree in chemical engineering		Type and Year	Optional. Year 1
Faculty	School of Industrial Engineering and Telecommunications			
Discipline	Optional Subjects			
Course unit title and code	1051 - Emerging Technologies in Chemical Engineering			
Number of ECTS credits allocated	3	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
E-mail	eugenio.bringas@unican.es
Office	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 2. DESPACHO EUGENIO BRINGAS ELIZALDE (S2013)
Other lecturers	NAZELY DIBAN-IBRAHIM GOMEZ JAVIER PINEDO ALONSO

3.1 LEARNING OUTCOMES

- 1) To identify potential applications of Chemical Engineering in emerging sectors
2) To provide technical alternatives to solve environmental, industrial and social problems
3) To apply the fundamentals of Chemical Engineering to solve problems in related areas

4. OBJECTIVES

The aim of the subject is to provide a novel approach through study cases of novel applications and technologies where chemical engineers play a decisive role.

6. COURSE ORGANIZATION

CONTENTS	
1	Bloques Organización UNIT 1. New materials in the development of emerging technologies in Chemical Engineering Chapter 1. Fundamentals of nanotechnology Chapter 2. Nanotechnology and environment. Development of novel treatment processes. Chapter 3. Nanomaterials and human health. Controlled drug delivery. Chapter 4. Fundamentals and applications of microfluidics.
2	UNIT 2. Contribution of Chemical Engineering to tissue engineering and therapeutic technologies Chapter 1. Introduction to tissue engineering Chapter 2. Scaffolds for cell support Chapter 3. Bioreactors in tissue engineering Chapter 4. Membranes for therapeutic technologies

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Written Exam about the contents covered in the theoretical and practical lectures (65%)	Written exam	Yes	Yes	65,00
Development of two case studies related with the topics covered in the subject. Oral presentation of one of the case studies (35%)	Work	Yes	Yes	35,00
TOTAL				100,00

Observations
In case of interruption of face-to-face learning by health alert activation, the assesment procedure will not be modified and it will be performed using virtual tools.

Observations for part-time students
Article 24 from 'Reglamento de los procesos de evaluación en la Universidad de Cantabria'

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Introducción a la nanotecnología / Charles P. Poole, Frank J. Owens. Editorial Reverté, Barcelona (2007)
Biomaterials, artificial organs and tissue engineering / edited by Larry L. Hench and Julian R. Jones. Boca Raton: CRC Press.Cambridge: Woodhead (2005)
Computational Fluid Dynamics for Engineers Bengt Andersson, Ronnie Andersson, Love Håkansson, Mikael Mortensen, Rahman Sudiyo and Berend Van Wachem CRC Press.Cambridge: UK (2011)