

## SUBJECT TEACHING GUIDE

M2108 - Emerging Technologies in Chemical Engineering

Master's Degree in chemical engineering

Academic year 2021-2022

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	M2108 - 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
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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	<p>Bloques Organización</p> <p>UNIT 1. New materials in the development of emerging technologies in Chemical Engineering</p> <p>Chapter 1. Fundamentals of nanotechnology</p> <p>Chapter 2. Nanotechnology and environment. Development of novel treatment processes.</p> <p>Chapter 3. Nanomaterials and human health. Controlled drug delivery.</p> <p>Chapter 4. Fundamentals and applications of microfluidics.</p>
2	<p>UNIT 2. Contribution of Chemical Engineering to tissue engineering and therapeutic technologies</p> <p>Chapter 1. Introduction to tissue engineering</p> <p>Chapter 2. Scaffolds for cell support</p> <p>Chapter 3. Bioreactors in tissue engineering</p> <p>Chapter 4. Membranes for therapeutic technologies</p>

## 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
<b>TOTAL</b>				<b>100,00</b>
<b>Observations</b>				
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.				
<b>Observations for part-time students</b>				
Article 24 from 'Reglamento de los procesos de evaluación en la Universidad de Cantabria'				

## 8. BIBLIOGRAPHY AND TEACHING MATERIALS

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