Proyecto/Guía docente de la asignatura Adaptada a la Nueva Normalidad

Se debe indicar de forma fiel como va a ser desarrollada la docencia en la Nueva Normalidad. Esta guía debe ser elaborada teniendo en cuenta todos los profesores de la asignatura. Conocidos los espacios y profesorado disponible, se debe buscar la máxima presencialidad posible del estudiante siempre respetando las capacidades de los espacios asignados por el centro y justificando todas las adaptaciones que se realicen respecto a la memoria de verificación Si la docencia de alguna asignatura fuese en parte online, deben respetarse los horarios tanto de clase como de tutorías).

Subject	DESIGN OF REACTION PROCESSES		
General subject	PROCESS DESIGN		
Module	1. PROCESS AND PRODUCT ENGINEERING		
Degree	MASTER IN CHEMICAL ENGINEERING		
Plan	542	**Code**	53747
Time period	2º SEMESTRE	**Type/Character**	MANDATORY
Level/Cycle	1º	**Course**	1º
Credits ECTS	6		
Language	ENGLISH Y ESPAÑOL		
Professor/s in charge	JUAN GARCÍA SERNA Y FRANCISCO SOBRÓN GRAÑÓN		
Department(s)	INGENIERÍA QUÍMICA Y TECNOLOGÍA DEL MEDIO AMBIENTE		
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1. Situation / Concept of the subject

1.1 Context

The design of processes with Chemical Reaction is one of the basic subjects in the curriculum of a Chemical Engineer.

1.2 Relation with other subjects

The subject of "Process Design with Reaction" is related to the subject of simulation processes of "Process Analysis with Simulators".

1.3 Prerequisites

This subject does not have specific prerequisites.

2. Competences

2.1 General

CG02. Conceive, project, calculate, and design processes, equipment, industrial facilities and services, in the field of chemical engineering and related industrial sectors, in terms of quality, safety, economy, rational and efficient use of natural resources and conservation of the environment ambient.

CG03. Direct and technically and economically manage projects, facilities, plants, companies and technology centres in the field of chemical engineering and related industrial sectors.

CG04. Carry out the appropriate research, undertake the design and direct the development of engineering solutions, in new or unfamiliar environments, relating creativity, originality, innovation and technology transfer.

CG06. Be able to analyse and synthesize the continuous progress of products, processes, systems and services using criteria of safety, economic viability, quality and environmental management.

CG07. Integrate knowledge and face the complexity of making judgments and decision making, based on incomplete or limited information, including reflections on the social and ethical responsibilities of professional practice.

CG10. Adapt to changes, being able to apply new and advanced technologies and other relevant developments, with initiative and entrepreneurial spirit.

CG11. Possess the skills of autonomous learning to maintain and improve the skills of chemical engineering that allow the continuous development of the profession.

2.2 Specific

CEP01. Apply knowledge of mathematics, physics, chemistry, biology and other natural sciences, obtained through study, experience, and practice, with critical reasoning to establish economically viable solutions to technical problems.

CEP02. Design products, processes, systems and services of the chemical industry, as well as the optimization of others already developed, taking as a technological base the various areas of chemical engineering, comprehensive processes and transport phenomena, separation operations and engineering reactions chemical, nuclear, electrochemical and biochemical.

CEP04. Have the ability to solve problems that are unfamiliar, incompletely defined, and have competing specifications, considering the possible solution methods, including the most innovative ones, selecting the most appropriate one, and being able to correct the implementation, evaluating the different design solutions .

CEP05. Direct and supervise all types of facilities, processes, systems and services of the different industrial areas related to chemical engineering.

3. Objectives

- Select the type of reactor and the most appropriate operating conditions based on the chemical transformation process.
- Apply calculation models to quantify conversions and equipment sizing in homogeneous and heterogeneous reactors.
- Analyze the influence of deviations of flow ideality on the behavior of reaction systems.

4. Contents and/or thematic blocks

Block 1: DESIGN OF CHEMICAL REACTION

Carga de trabajo en créditos ECTS: 6

a. Context and justification

See 1.

b. Learning objectives

See 3.

c. Contents

The subject is developed in English language mainly.

The contents are divided into 5 topics:

TOPIC 1. INTRODUCTION TO CHEMICAL REACTION ENGINEERING

TOPIC 2. STOICHIOMETRY AND KINETICS

TOPIC 3. HOMOGENEOUS REACTIONS & REACTORS

TOPIC 4. NON-IDEAL FLOW AND REACTORS

TOPIC 5. HETEROGENEROUS REACTIONS & REACTORS

d. Teaching methods

See 5.

e. Working plan

Week 1: Start of the course

Week 8: Assignment 1

Week 10: Assignment 2

Week 15: Assignment 3

f. Evaluation

See 7.

g Material docente

Esta sección será utilizada por la Biblioteca para etiquetar la bibliografía recomendada de la asignatura (curso) en la plataforma Leganto, integrada en el catálogo Almena y a la que tendrán acceso todos los profesores y estudiantes. Es fundamental que las referencias suministradas este curso estén actualizadas y sean completas. Los profesores tendrán acceso, en breve, a la plataforma Leganto para actualizar su bibliografía recomienda ("Listas de Lecturas") de forma que en futuras guías solamente tendrán que poner el enlace permanente a Leganto, el cual también se puede poner en el Campus Virtual.

g.1 Bibliografía básica

- The reference book available in the electronic library of UVa will be:

  Coulson and Richardson's chemical engineering. Volume 3A, Chemical and biochemical reactors and reaction engineering e-book UVa

g.2 Bibliografía complementaria

g.3 Otros recursos telemáticos (píldoras de conocimiento, blogs, videos, revistas digitales, cursos masivos (MOOC), ...)

h. Recursos necesarios

Python

MATLAB

Microsoft Teams.

i. Temporalización

CARGA ECTS	PERIODO PREVISTO DE DESARROLLO
TOPIC 1 – 0.5 ECTS	Week 1-2
TOPIC 2 – 0.5 ECTS	Week 2-3

TOPIC 3 – 1 ECTS	Weeks 3-5
TOPIC 4 – 2 ECTS	Weeks 6-10
TOPIC 5 – 2 ECTS	Weeks 11-15

5. Teaching methods and methodological principles

The resources and the method used are:

- Classes on blackboard and Powerpoint
- Problem resolution
- Computer programming (Python, MATLAB and Excel VBA)
- Seminars to carry out tasks.

6. Dedicational time of the student to the subject

PRESENTIAL ACTIVITIES	HORAS	NON PRESENTIAL ACTIVITIES	HOURS
Theory	15	Study and autonomous work individual	50
Practice in the aula	30	Study and autonomous work in groups	40
Seminars	6		
Laboratories	8		
Tutorial service			
Evaluation (out of the official examination period)	1		
Total face-to-face activities	60	Total non face-to-face activities	90

7. System and characteristics of the evaluation

INSTRUMENT/PROCEDURE	VALUE IN FINAL MARK	REMARKS
TASK 1 to 3	40%	The guidelines will be included in each task.
CONTINUOUS EVALUATION and EXAMINATIONS.	40%	It will consist of different evaluation techniques assessed during the course.
ATTITUDE IN CLASS	20%	It will be considered: • Participation in class • Generation of ideas • Attitude and relation with the other class mates
MARK CRITERIA		

• **Ordinary call:**
  ○ As per specification in the table.
• **Extraordinary call:**
  ○ A minimum mark of 4.0 is required in the written test (exam) to pass.
  ○ The available assignments marks and attitude in class marks will be preserved to calculate the final mark. The final mark will consider:
  ○ Task 1-3 *(33.33%)*
  ○ Attitude in class *(16.67%)*
  ○ Extraordinary written test (examination) *(50%)*		

8. Final remarks

No extra remarks.

ADDENDUM to the Project/Teaching guide of the subject Adapted to the New Normality

Criteria for this addendum to force into action:

When more than 50% of the university teaching days of the term are spent in a contingency situation, the evaluation criteria will be that as indicated in this addendum.

A4. Contents and Thematic Blocks

Block 1. DESIGN OF CHEMICAL REACTION

On-line teaching methods

All or part of the course face-to-face activities may be developed on-line depending on the directions/orders or recommendations of the competent authorities.

The software and techniques used in each case will be such determined or recommended by the competent authorities in each case.

On-line evaluation

All or part of the course evaluation may be developed on-line depending on the directions/orders or recommendations of the competent authorities.

The software and techniques used in each case will be such determined or recommended by the competent authorities in each case.