GUÍA DOCENTE ABREVIADA DE LA ASIGNATURA

G716 - Industrial Chemistry

Grado en Ingeniería en Tecnologías Industriales
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Curso Académico 2024-2025

1. DATOS IDENTIFICATIVOS				
Título/s	Grado en Ingeniería en Tecnologías Industriales Grado en Ingeniería en Tecnologías Industriales		Tipología y Curso	Obligatoria. Curso 4 Obligatoria. Curso 4
Centro	Escuela Técnica Superior de Ingenieros Industriales y de Telecomunicación			
Módulo / materia	MATERIA QUÍMICA INDUSTRIAL MÓDULO DE SELECCIÓN DE TECNOLOGÍAS ESPECÍFICAS			
Código y denominación	G716 - Industrial Chemistry			
Créditos ECTS	6	Cuatrimestre	Cuatrimestral (1)	
Web				
Idioma de impartición	Inglés		Forma de impartición	Presencial

Departamento	DPTO. DE QUIMICA E INGENIERIA DE PROCESOS Y RECURSOS.
Profesor responsable	JAVIER RUFINO VIGURI FUENTE
E-mail	javier.viguri@unican.es
Número despacho	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 3. DESPACHO PROFESORES (S3013)
Otros profesores	TAMARA LLANO ASTUY

3.1 RESULTADOS DE APRENDIZAJE
- Apply and execute basic calculations to solve mass and heat transfer unit operations and ideal reactors.
- Create and interpret chemical process designs at preliminary level
- Apply modern process simulation tools to industrial process subsystems synthesis and analysis

4. OBJETIVOS

The objective for the students is to be able to interpret industrial processes based on chemical reaction, apply separation unit operations to raw material and product purification and to be able to create, analyze and evaluate preliminary chemical process designs to meet desired needs.

6. ORGANIZACIÓN DOCENTE

	CONTENIDOS
1	PART I: 1.- INTRODUCTION 1.1.-Introduction to the Industrial Chemistry
2	PART II: 2.- MATERIALS and ENERGY FLOW ANALYSIS 2.1.-Mass and energy balances. 2.2.-Mass transfer and separation unit operations. 2.3.-Materials flow analysis. Valorization 2.4.- Case studies
3	PART III: 3.- CHEMICAL REACTION ENGINEERING 3.1.- Chemical kinetics 3.2.- Chemical reactor design. 3.3.- Unit operations involving chemical reaction. 3.4.- Bioprocess Engineering 3.5.- Case studies
4	PART IV 4.- PROCESS SYSTEM ENGINEERING 4.1.- Preliminary process design 4.2.- Product design 4.3.- Modeling, simulation and optimization 4.4.- Practical Classes. Simulation of case studies with mass and energy balances, unit operations and chemical reator.

7. MÉTODOS DE LA EVALUACIÓN

Descripción	Tipología	Eval. Final	Recuper.	%
Individual Exam 1	Examen escrito	No	Sí	30,00
Individual Exam 2	Examen escrito	No	Sí	30,00
Practical work	Evaluación en laboratorio	No	No	15,00
Case Studies	Trabajo	No	Sí	25,00
TOTAL				100,00

Observaciones

Each partial exam with a minimum average grading of 5 (0-10 mark system) to access to the continuous assessment. Average of the partial exams will be done only when both partials reach the minimum grade of 5.0. Practical work in computer room: Exam in computer room (10 pt.) + Delivery of problems in each session and active participation (5pt.) + minimum of 90 % attendance at practical class in computer room. Minimum 90% attendance at practical class of working groups solving the case studies. Case studies (CS), with a total of 25 pt. and a minimum 90% attendance, include six deliverables (3 pt./each), report of poster session (3.5 pt.) and questionnaire of factory visit (3.5 pt.); poster session and factory visit are mandatory activities. Ordinary final exam will be related to the fail partial exams (grading lower than 5.0) during continuous assessment (partial exams 1 or/and 2). Extraordinary exam will be related to the entire course (partial exam 1 + partial exam 2) regardless of the marks obtained in the partial exams and /or in the ordinary exam.

Criterios de evaluación para estudiantes a tiempo parcial

Part-time students may choose between the continuous assessment or assessment in Ordinary and Extraordinary call of exams together the delivery of the Case Studies and Aspen works under the scheduling of the teachers .

8. BIBLIOGRAFÍA Y MATERIALES DIDÁCTICOS

BÁSICA

Felder, R.M., Rousseau, R.W., 2019. 4th Ed. Elementary principles of chemical processes. John Wiley & Sons, Inc.

Geankoplis C.J., 2013. Transport processes and separation process principles : (includes unit operations) 4th. ed. Prentice Hall Professional Technical Reference

Levenspiel O., 1999. Chemical reaction engineering. 3rd Ed. John Wiley & Sons

Fogler H.S., 2020, Elements of chemical reaction engineering. 6th Ed. Prentice Hall, PTR.

Seider, W., Lewin, D., Seader, J., Widadgo, S., Gani, R., Ng, K.M., 2017, Product and Process Design Principles. 4th Ed. John Wiley & Sons.

Shuler, M.L., Kargi, F. 2002, Bioprocess Engineering. Basic Concepts. Prentice Hall

Himmelblau D.M., Riggs, J.B., 2023. Basic Principles and calculations in chemical engineering:International. 9th. Ed. Addison-Wesley

Simpson, R., Sastry, S., 2013, Chemical and Bioprocess Engineering. Springer.

Asokan, K., 2007. Chemical Process Calculations: Lecture Notes. Ed. Universities Press.

Roy Ghatak, H., 2018, Reaction engineering Principles. Formato electrónico.CRC Press.

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.