

[MHC201] CHEMICAL PROCESS TECHNOLOGY

GENERAL INFORMATION

Studies	UNIVERSITY MASTER IN INDUSTRIAL ENGINEERING		Subject	?
Semester	1	Course	2	Mention / Field of specialisation
Character	COMPULSORY		Language	CASTELLANO
Plan	2022	Modality	Face-to-face	Total hours 31 class hours + 44 non-class hours = 75 total hours
Credits	3	Hours/week	1.72	

2030 AGENDA GOALS



PROFESSORS

AROSTEGUI OCHOA, ASIER

OTEGI MARTINEZ, NAGORE

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
(No specific previous subjects required)	[I] Fundamentos de Química

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
MHRA04 - To analyze and design chemical processes		x		2,36
MHRA27 - To demonstrate the ability to integrate knowledge and face the complexity of formulating judgments based on information that, being incomplete or limited, includes reflections on the social, health and safety, environmental, economic and industrial implications and responsibilities		x		0,2
MHRA28 - To communicate your conclusions and the knowledge and ultimate reasons that support them to specialized and non-specialized audiences in a clear and unambiguous way		x		0,12
MHRA30 - To work with people, involving and directing them in a dynamic aimed at a common objective that includes reflection on their ethical and social responsibility, with a global vision of the work to be carried out and the characteristics that it requires (quality, deadlines,...), assuming responsibility for the decisions made		x		0,12
MHR126 - To apply the knowledge acquired and your problem-solving skills in new, little-known or changing environments within broader (or multidisciplinary) contexts related to your area of study		x		0,2
Total:				3

KC: Knowledge or Content / SK: Skills / AB: Abilities

ENAE LEARNING RESULTS

ENA123 - Knowledge and comprehension: Deep knowledge and comprehension of mathematics and other basic sciences inherent in their engineering speciality, allowing them to achieve the other competencies of the degree.	0,6
ENA124 - Knowledge and comprehension: Deep knowledge and comprehension of the engineering disciplines of their speciality, at the level necessary to acquire the rest of the competencies of the degree.	0,6
ENA128 - Analysis in engineering: Ability to conceive new products, processes, and systems.	0,5
ENA140 - Practical application of engineering: Complete knowledge of application of materials, equipment and tools, engineering technology and processes, and their limitations.	0,7
ENA141 - Practical application of engineering: Ability to apply standards of engineering practice.	0,6
Total:	3

SECONDARY LEARNING RESULTS

RMH141 [I] Resuelve balances de materia y energía en reactores donde se da un proceso químico

LEARNING ACTIVITIES	CH	NCH	TH
Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning		26 h.	26 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints	2 h.	8 h.	10 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	12 h.		12 h.
Carrying out exercises and solving problems individually and/or in teams	10 h.		10 h.
Carrying out visits and/or learning trips to other university centres, laboratories, companies and/or thermal power plants	2 h.		2 h.

EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	20%	Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems
Individual written and/or oral tests or individual coding/programming tests	80%	Individual written and/or oral tests or individual coding/programming tests
CH - Class hours: 26 h. NCH - Non-class hours: 34 h. TH - Total hours: 60 h.		

RMH142 [I] Conoce y diseña operaciones básicas de la ingeniería química			
LEARNING ACTIVITIES	CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams	5 h.	10 h.	15 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISMS	
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%	Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	
CH - Class hours: 5 h. NCH - Non-class hours: 10 h. TH - Total hours: 15 h.			

CONTENTS

1. Separation techniques1.1. Introduction1.2. Equilibrium-based separations1.3. Multi-stage separations2. Balances of matter in chemical processes2.1. Balance equations. Total balance of matter2.2. Balances of matter in stationary regime2.3. Balances of matter in non-steady-state regime3. Energy balances in chemical processes3.1. Forms of energy: the first law of thermodynamics3.2. Energy balances in non-reactive processes3.3.3.3. Energy balances in reactive processes3.3.4. Chemical reactors. Fundamentals and types4.1. Introduction to reactors4.2. Types of reactors4.3. Ideal reactors4.4. Catalytic reactors

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Moodle Platform	Felder R.M., Rousseau R.W. Principios elementales de los procesos químicos, 3a edición, J. Wiley, 2000.
Slides of the subject	Himmelblau D.M. Principios básicos y cálculos en Ingeniería Química, 6a Ed., Pearson Educación, 2002.
Topic related web quires	Levenspiel O. Ingeniería de las reacciones químicas. 3a ed. México: Limusa Wiley, 2004.
	Scott Fogler H. Elementos de ingeniería de las reacciones químicas, Pearson Prentice Hall, 2008.
	Calleja, G., García, F., De Lucas, A., Prats, D., Rodríguez, J.M. Introducción a la Ingeniería Química, Ed. Síntesis, 2004