

SUBJECT TEACHING GUIDE

1115 - Carbon chemistry and petrochemistry

Master's Degree in mining engineering

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Academic year 2025-2026

1. IDENTIFYING DATA					
Degree	Master's Degree in mining engineering Master's Degree in mining engineering			Type and Year	Compulsory. Year 1 Compulsory. Year 1
Faculty	School of Mines and Energy Engineering				
Discipline	SCIENTIFIC EXPANSION				
Course unit title and code	1115 - Carbon chemistry and petrochemistry				
Number of ECTS credits allocated	3	Term	Semester based (1)		
Knowledge Field	Architecture, construction, building and urban planning, civil engineering Architecture, construction, building and urban planning, civil engineering				
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIAS QUIMICA Y BIOMOLECULAR				
Name of lecturer	MARTA RUMAYOR VILLAMIL				
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Other lecturers	ESTHER SANTOS SANTAMARIA				

4. OBJECTIVES
Carbochemical engineering: industrial uses of coal as raw material for the production of liquid fuels and other chemicals; processes of pirolisis, liquefaction and gasification; environmental considerations (CO2 footprint). Petrochemical engineering: definition of petrochemicals (feedstocks, intermediates and finished products) and conversion processes for selected petrochemicals.

6. SUBJECT PROGRAM	
CONTENTS	
1	Part 1. Carbochemical engineering 1.1. Industrial uses of coal for the production of liquid fuels 1.2. Conversion processes: pyrolysis, liquefaction, gasification 1.3. Environmental considerations: CO2 footprint
2	Part 2. Petrochemical engineering 2.1. Definition of petrochemicals: feedstocks, intermediates, and finished products 2.2. Naphtha craking 2.3. Conversion processes of selected petrochemicals 2.4. Simulation of case studies
3	Part 3. Other environmental considerations 3.1. Carbon footprint

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Written exam of the subject (Parts 1, 2 and 3) Mínimum mark: 5,00 (0-10) Date: in dates fixed by the School for the ordinary and extraordinary calls. Contribution to overall grading mark: 60 %.	Written exam	Yes	Yes	60,00
Written reports of individual and group activities Mínimum mark: 5,00 (0-10) Date: two weeks after each activity is proposed and worked Contribution of the overall grading mark: 30 %	Work	No	Yes	30,00
Written reports of the practice activities Mínimum mark: 0,00 (0-10) Date: a week after each activity is completed Contribution of the overall grading mark: 10 %	Work	No	Yes	10,00
TOTAL				100,00
Observations				
The recovery will take place in the special period dedicated to the effect (extraordinary evaluation call) and in the same form of the tests of the ordinary evaluation. Those students who have not passed the parts of computer practices and work, will be able to return the corrected reports before the dates of the evaluation test schedule established by the school.				
Observations for part-time students				
The evaluation of the subject can be adapted to the partial time students upon request.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
<ul style="list-style-type: none"> - Chaudhuri, U.R., Fundamentals of petroleum and petrochemical engineering, Taylor and Francis Group, 2011. - Dubois, R.A., Gavioli, N. Producción de Olefinas : etileno, propileno, butileno y superiores, Nueva Librería, 2013. - Gary, J.H., Handwerk, G.E., Petroleum refining, technology and economics, Marcel Dekker, 4 ed., 2001. - Jayarama, R., Clean Coal Technologies, CRC Press, 2014. - Speight, J.G., The chemistry and technology of coal, CRC Press, 3ed, 2013. - Speight, J.G., The chemistry and technology of petroleum, CRC Press, 4 ed., 2007. - Vian, A., Introducción a la química industrial, Reverté, 2ed, 1999.

