



## 1. General information

Course: ORGANIC CHEMISTRY III  
 Type: CORE COURSE  
 Degree: 409 - CHEMISTRY  
 Center: 1 - FACULTY OF SCIENCE AND CHEMICAL TECHNOLOGY  
 Year: 3

Code: 57318

ECTS credits: 6  
 Academic year: 2023-24

Group(s): 20 23

Duration: First semester

Second language: English

English Friendly: Y

Bilingual: N

Main language: Spanish

Use of additional languages:

Web site:

Lecturer: ANGEL DIAZ ORTIZ - Group(s): 20 23					
Building/Office	Department	Phone number	Email	Office hours	
S. Alberto Magno, 2ª planta	QUÍMICA INORG., ORG., Y BIOQ.	3461	angel.diaz@uclm.es	Mon, Tue 10 to 12h and Thr from 11 to 13h	
Lecturer: ANDRES MORENO MORENO - Group(s): 20 23					
Building/Office	Department	Phone number	Email	Office hours	
San Alberto Magno	QUÍMICA INORG., ORG., Y BIOQ.	926051965	andres.moreno@uclm.es	Mon, Wed and Thr 16:30-18:30h	
Lecturer: JULIAN RODRIGUEZ LOPEZ - Group(s): 20 23					
Building/Office	Department	Phone number	Email	Office hours	
San Alberto Magno, 1ª planta	QUÍMICA INORG., ORG., Y BIOQ.	3462	julian.rodriguez@uclm.es	Mon, Wed, Thr from 16:30 to 18:30h	
Lecturer: JUAN TEJEDA SOJO - Group(s): 20 23					
Building/Office	Department	Phone number	Email	Office hours	
S. Alberto Magno	QUÍMICA INORG., ORG., Y BIOQ.	926042526	juan.tejeda@uclm.es	Tue, Wed, Thr from 17 to 19h	
Lecturer: ESTER VAZQUEZ FERNANDEZ-PACHECO - Group(s): 20 23					
Building/Office	Department	Phone number	Email	Office hours	
Marie Curie, 3ª planta	QUÍMICA INORG., ORG., Y BIOQ.	+34 926 05 21 57	ester.vazquez@uclm.es	Mon, Tue, Thr from 12:30 to 14:30h	

## 2. Pre-Requisites

Not established, although it is recommendable to have studied General Organic Chemistry

## 3. Justification in the curriculum, relation to other subjects and to the profession

Organic Chemistry III is included in the Fundamentals of Chemistry module in the Chemistry Degree. It is designed to develop the fundamental concepts and data of Organic Chemistry, to show the experimental evidence that supports these concepts, to apply these... The subject Organic Chemistry III is compulsory and corresponds to one semester of the third year of the degree. The subject consists of 6 credits, of which 4.5 are theoretical and the remaining 1.5 are practical. The course aims to delve into the knowledge acquired

## 4. Degree competences achieved in this course

## Course competences

Code	Description
CB02	Apply their knowledge to their job or vocation in a professional manner and show that they have the competences to construct and justify arguments and solve problems within their subject area.
E01	Understand and use chemical terminology, nomenclature, conventions and units
E02	Deduce the variation of the properties of the chemical elements according to the Periodic Table
E03	Handle chemicals safely and with respect to the environment
E05	Know the chemical elements and their compounds, their forms of obtaining, structure, properties and reactivity, as well as the main techniques for their analysis
E06	Know the structural properties of chemical compounds, including stereochemistry, as well as the main structural research techniques
E07	Relate macroscopic properties with those of atoms, molecules and non-molecular chemical compounds
E09	Know the kinetics of chemical change, including catalysis and reaction mechanisms
E15	Know how to handle the standard chemical instrumentation and be able to elaborate and manage standardized procedures of work in the laboratory and chemical industry
E16	Plan, design and develop projects and experiments
E17	Develop the ability to relate to each other the different specialities of Chemistry, as well as this one with other disciplines (interdisciplinary character)
G01	Know the principles and theories of Chemistry, as well as the methodologies and applications characteristic of analytical chemistry, physical chemistry, inorganic chemistry and organic chemistry, understanding the physical and mathematical bases that require
G02	Be able to gather and interpret data, information and relevant results, obtain conclusions and issue reasoned reports on scientific, technological or other problems that require the use of chemical tools
G03	Know how to apply the theoretical-practical knowledge acquired in the different professional contexts of Chemistry
G04	Know how to communicate, orally and in writing, the knowledge, procedures and results of chemistry, both specialized and non-specialized
G05	Acquire and adapt new knowledge and techniques of any scientific-technical discipline with incidence in the chemical field
T03	Proper oral and written communication
T06	Ability to approach decision making
T07	Ability to work as a team and, where appropriate, exercise leadership functions, fostering the entrepreneurial character
T09	Motivation for quality, job security and awareness of environmental issues, with knowledge of internationally recognized systems for the correct management of these aspects
T10	Ability to use specific software for chemistry at user level
T11	Ability to obtain bibliographic information, including Internet resources

## 5. Objectives or Learning Outcomes

## Course learning outcomes

Description

Know the structure of the main organic functional groups

Know the structure and function of organic natural products.

Know the utility of the spectroscopic techniques in Organic Chemistry

Acquire the ability to interpret the experimental results, relating each experimental stage with the theoretical knowledge acquired

Know the main preparation methods and the reactivity of the main organic functional groups and relate it to its structure

Learn to develop topics and acquire skills in the oral and written presentation at the time of the presentation of results.

Learn to work autonomously in a laboratory and know how to interpret the experimental results obtained.

Recognize the main reactive intermediates and the influence of stereoelectronic effects on their stability and reactivity

Know how to apply the knowledge of Organic Chemistry to the solution of synthetic and structural problems

Know the stereochemistry of organic compounds and the stereoselectivity of the main reactions.

Know the basic principles of Organic Chemistry.

To ensure that the student is able to search and select information in the field of Organic Chemistry and that he / she is capable of processing and presenting it adequately both orally and in writing, developing his / her synthesis capacity, being critical and objective

To develop in the student the capacity of initiative to pose and solve concrete problems of Organic Chemistry, as well as to interpret the obtained results

Develop your ability to work as a team.

Acquire the necessary practical training to apply it in your professional life. Know the main methods of isolation, purification and characterization of organic compounds

Acquire the ability to handle chemical reagents and organic compounds safely.

Acquire an awareness of environmental protection developing the idea that Organic Chemistry should be used to improve the quality of life.

Encourage and promote in the student all those values and attitudes inherent to scientific activity.

Know the main aspects of the terminology and nomenclature in Organic Chemistry

## 6. Units / Contents

Unit 1: Selectivity in organic chemistry  
 Unit 2: Retrosynthetic analysis. Disconnections in aromatic compounds  
 Unit 3: Disconnections in molecules with carbon-heteroatom groups  
 Unit 4: C-C disconnections in molecules with a single functional group  
 Unit 5: C-C disconnection in molecules with two functional groups  
 Unit 6: Disconnection in rings

## 7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	E01 E06 E17 G01 T11	0.84	21	N	-	
Class Attendance (practical) [ON-SITE]	Practical or hands-on activities	E01 E03 E16 G02 G03 G04 T11	0.8	20	Y	Y	
Workshops or seminars [ON-SITE]	Problem solving and exercises	E01 E16 G02 G03 T11	0.64	16	Y	N	
Study and Exam Preparation [OFF-SITE]	Self-study	E16 G01 T11	3.6	90	N	-	
Mid-term test [ON-SITE]		E17 G03 G04	0.04	1	Y	Y	
Final test [ON-SITE]		E17 G03 G04	0.08	2	Y	Y	
<b>Total:</b>			<b>6</b>	<b>150</b>			

Total credits of in-class work: 2.4	Total class time hours: 60
Total credits of out of class work: 3.6	Total hours of out of class work: 90

As: Assessable training activity

Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

### 8. Evaluation criteria and Grading System

Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Laboratory sessions	15.00%	15.00%	The practical credits will be graded jointly by means of a written test, and by means of daily laboratory work in which aspects such as: skill, order, capacity for initiative will be taken into account.
Mid-term tests	35.00%	0.00%	A 2-hour progress test will be conducted to assess the followup of the learning process. In this section a minimum of 4.0/10 is required.
Final test	35.00%	85.00%	A final exam will be taken (those students who are exempted from taking the final exam this percentage will be added to the progress tests)
Assessment of problem solving and/or case studies	15.00%	0.00%	The resolution of problems by the student will be positively valued, as well as their active participation in class. On the other hand, the student will be able to increase his mark delivering seminars to the teacher.
<b>Total:</b>	<b>100.00%</b>	<b>100.00%</b>	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences).

#### Evaluation criteria for the final exam:

##### Continuous assessment:

Class attendance is recommended, although it is not mandatory.

Practical class attendance is compulsory, and it is also an essential requirement to pass the subject of Organic Chemistry III.

In the continuous assessment mode, a minimum of 4/10 will be required in the progress tests and the average must be equal to or greater than 5/10.

##### Non-continuous evaluation:

Final test: 85%

Laboratory: 15%

### 9. Assignments, course calendar and important dates

#### Not related to the syllabus/contents

Hours	hours
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	20
Study and Exam Preparation [AUTÓNOMA][Self-study]	90
Mid-term test [PRESENCIAL][ ]	3
<b>Unit 1 (de 6): Selectivity in organic chemistry</b>	
<b>Activities</b>	
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Workshops or seminars [PRESENCIAL][Problem solving and exercises]	1
<b>Unit 2 (de 6): Retrosynthetic analysis. Disconnections in aromatic compounds</b>	
<b>Activities</b>	
Class Attendance (theory) [PRESENCIAL][Lectures]	1
Workshops or seminars [PRESENCIAL][Problem solving and exercises]	2
<b>Unit 3 (de 6): Disconnections in molecules with carbon-heteroatom groups</b>	
<b>Activities</b>	
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Workshops or seminars [PRESENCIAL][Problem solving and exercises]	3
<b>Unit 4 (de 6): C-C disconnections in molecules with a single functional group</b>	
<b>Activities</b>	
Class Attendance (theory) [PRESENCIAL][Lectures]	6
Workshops or seminars [PRESENCIAL][Problem solving and exercises]	3
<b>Unit 5 (de 6): C-C disconnection in molecules with two functional groups</b>	
<b>Activities</b>	
Class Attendance (theory) [PRESENCIAL][Lectures]	8
Workshops or seminars [PRESENCIAL][Problem solving and exercises]	6
<b>Unit 6 (de 6): Disconnection in rings</b>	
<b>Activities</b>	
Class Attendance (theory) [PRESENCIAL][Lectures]	1
Workshops or seminars [PRESENCIAL][Problem solving and exercises]	1
<b>Global activity</b>	
<b>Activities</b>	
Mid-term test [PRESENCIAL][ ]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	90
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	20
Class Attendance (theory) [PRESENCIAL][Lectures]	21
Workshops or seminars [PRESENCIAL][Problem solving and exercises]	16
<b>Total horas: 150</b>	

### 10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	City	ISBN	Year	Description
Warren, Stuart	Organic Synthesis: the disconnection approach	Wiley		978-0-470-71236-8	2008	
Wyatt, Paul	Organic synthesis: strategy and control	John Wiley		978-0-471-92963-5	2007	
Corey, E.J.	The logic of chemical synthesis			0-471-50979-5	1989	
MackIE, Raymond K.	Guidebook to organic synthesis	Longman Scientific and Technical		0-582-45592-8	1982	
Fuhrhop, Jürgen	Organic synthesis: concepts and methods	Wiley-VCH		3-527-30273-5	2003	
Carruthers, William	Modern methods of organic synthesis	Cambridge University		978-0-521-77830-5	2007	
Borrell Bilbao, José I.	Síntesis orgánica	Síntesis		84-7738-653-6	2003	