COURSE GUIDE 2026/27

Faculty 215 - Faculty of Chemistry **Cycle** .

Degree GQUIMI20 - Bachelor's Degree in Chemistry **Year** Third year

COURSE

26114 - Organic Chemistry II **Credits, ECTS:** 9

COURSE DESCRIPTION

In this course, students will deepen their knowledge of organic chemistry through the study of modern methods of organic synthesis, general reactions and their specific versions, and their application to the synthesis of organic compounds.
The course includes an experimentation laboratory in Organic Chemistry, oriented to the planning and execution of the synthesis of simple organic molecules.

COMPETENCIES/LEARNING RESULTS FOR THE SUBJECT

The objectives of the course are as follows:

1) Know the structural characteristics and the symmetry and stereochemistry of organic compounds.

2) Become familiar with modern methods of organic synthesis, including specific reactions and versions.

3) Know the most important reaction mechanisms, considering aspects of chemo- and stereoselectivity.

4) Be able to propose short syntheses of simple compounds.

The aim is for the student to develop the basic and general competences defined in the RD1393/2007 for this level in the field of Chemistry as well as the following transversal competences (Fundamental Module M02):

-- M02MC08: Ability to select different instrumental techniques, simple or combined, for the characterisation of chemical substances.

-- M02MC09: To be able to present orally and in writing, in an understandable way, phenomena and processes related to Chemistry and related subjects.

-- M02MC10: Ability to search for and select information in the field of Chemistry and other scientific fields, making use of the bibliography.

-- M02CM11: Being able to relate Chemistry to other disciplines, as well as to understand its impact on today's society and the importance of the industrial chemical sector.

Successful completion of the course should also enable the student to acquire the following specific competences (Modules M01 and M02):

-- M01CM03: Safe use of the usual laboratory means and techniques.

-- M01CM05: Ability to observe, analyse and present results in the field of chemistry and other sciences.

-- M02CM02: Knowledge of the structure, properties, methods of preparation and the most important chemical reactions of the chemical elements and their compounds.

-- M02CM03: Ability to plan and carry out in the laboratory simple processes of synthesis and characterisation of chemical compounds, safely and using the most appropriate techniques, as well as to evaluate and interpret data derived from experimental observations.

The horizontal and vertical coordination of the subject in the Module and in the Degree will be ensured by the Commission ofCoordination of the Degree

Theoretical and Practical Contents

1. Structure, Symmetry and Stereochemistry of Organic Compounds.

Basic principles. Chirality. Stereogenic elements. Structural determination of the absolute and relative relative configuration. Conformational analysis Prochirality and topicity Stereoselective reactions.

2. Chemical transformations. Reactivity and Mechanisms.

- Formation of simple carbon-carbon bonds. Reactivity of enols and enolates. Alkylation reactions, conjugate additions and the aldol reaction with its variants. Asymmetric reactions.

- Formation of carbon-carbon multiple bonds and their reactivity. Elimination reactions (E1, E2 and E1cB). Syn pyrolytic eliminations, alkenes from hydrazones, diols and alkynes. Olefination reactions: Wittig and its variants, Julia'svariants, Julia and Peterson olefins. Olefin metathesis.

- Oxidations

- Reductions

TEACHING METHODS

Delivery of general content. Lectures supported by multimedia elements (Power Point presentations, videos, web pages) and other types of teaching material (molecular models).

TYPES OF TEACHING

Types of teaching	M	S	GA	GL	GO	GCL	TA	TI	GCA
Hours of face-to-face teaching	40	10	15	25					
Horas de Actividad No Presencial del Alumno/a	60	22,5	15	37,5					

Legend:
M: Lecture-based | S: Seminar | GA: Applied classroom-based groups
GL: Applied laboratory-based groups | GO: Applied computer-based groups | GCL: Applied clinical-based groups
TA: Workshop | TI: Industrial workshop | GCA: Applied fieldwork groups

Evaluation methods

- Continuous evaluation
- End-of-course evaluation

Evaluation tools and percentages of final mark

- Written test, open questions 70%
- Exercises, cases or problem sets 30%

ORDINARY EXAMINATION PERIOD: GUIDELINES AND OPTING OUT

The tests and evaluation activities for this course will be carried out in accordance with the principles of academic integrity, honesty, and ethical conduct established in the regulations of the University of the Basque Country (EHU/UPV). Upon joining the University, students signed the Declaration of Commitment to Ethical Conduct and Academic Honesty, pledging not to engage in plagiarism, academic fraud, or the use of unauthorized materials or devices ¿ including artificial intelligence tools when they are not expressly permitted ¿ in exams and academic assignments. Failure to comply with these obligations may result in the academic and disciplinary consequences set out in the current university regulations.

A) CONTINUOUS EVALUATION
Continuous evaluation is applied only in the ordinary exam session. The tests and their corresponding weightings for obtaining the final grade are:

-20% Written mid¿term exams (open¿ended)
-50% Final written exam (open¿ended)
-10% Seminars and classroom activities
-20% Laboratory practices

Failure to complete any of the tests mentioned above, or submitting assignments after the deadline, will result in a grade of zero for that component.

To average the marks and obtain the final grade, it is essential to obtain a minimum score of 4.0/10 in the final exam and 5.0/10 in the laboratory practices. Attendance at laboratory sessions is compulsory.

A grade of NOT ATTENDED will be given to any student who does not appear on the day of the written exam, in accordance with Article 12, Chapter II of the regulations governing assessment in undergraduate degrees.

In continuous assessment, students may withdraw from the exam session. To do so, they must submit a written withdrawal request to the instructor at least one month before the end of the teaching period. In this case, the grade awarded will be NOT ATTENDED.

B) EVLUATION THROUGH A FINAL EXAM

Evaluation through a final exam may be carried out in the ordinary exam session only if the student has submitted a written request to withdraw from continuous evaluation to the course instructor. The deadline for submitting this request is 18 weeks from the start of the course.

The tests and weightings in the final exam system are:

-80% Final written exam
-20% Laboratory practices

To average the marks and obtain the final grade, it is essential to obtain a minimum score of 5.0 in the final exam and 5.0 in the laboratory practices.

Failure to attend the final exam will constitute AUTOMATIC WITHDRAWAL from the corresponding exam session. The grade awarded will be NOT ATTENDED.

C) REGULATIONS
For more detailed information, see the Regulations Governing the Evaluation of Students in Official Undergraduate Degrees, Articles 8, 9 and 10 of Chapter II (BOPV, 13 March 2017).

EXTRAORDINARY EXAMINATION PERIOD: GUIDELINES AND OPTING OUT

The extraordinary exam session is evaluated exclusively through a FINAL EXAM.
Both the evaluation criteria and the withdrawal conditions are the same as those described in section B of the ordinary exam session.

MANDATORY MATERIALS

As indicated by the teacher and at least one text from the basic bibliography. Personal laboratory equipment, especially lab coat, safety goggles, spatula and latex gloves.

BIBLIOGRAPHY

Basic bibliography

Structure, symmetry and stereochemistry:

1.E. Juaristi, Introduction to Stereochemistry and Conformational Analisis, John Wiley, New York.
2.A. Bassindale, The Third Dimension in Organic Chemistry, Ed. John Wiley & Sons, New York, 1991.
3.E. Eliel, S. H. Wilen, Stereochemistry of Organic Compounds, Ed. John Wiley & Sons, New York, 1994.
4.D. Nasipuru, Stereochemistry of Organic Compounds: Principles and Applications, John Wiley & Sons, New York, 1991.

Organic reactions. Reactivity and mechanisms:

5.F. A. Carey, Advanced Organic Chemistry, Kluver Academic, New York, 2001.
6.J. Clayden, N. Greeves, S. Warren, Organic Chemistry, Oxford University Press, 2012.
7.D. Klein, Química Orgánica, Ed. Panamericana, 2014

Detailed bibliography

1. ORGANIC SYNTHESIS: THE DISCONNECTION APPROACH. S. Warren, P. Hyatt, Wiley, 2008.
2. ORGANIC CHEMISTRY. J. Clayden, N. Greeves, S. Warren, P. Wothers, Oxford, 2005.
3. SÍNTESIS ORGÁNICA. RESOLUCIÓN DE PROBLEMAS POR EL MÉTODO DE DESCONEXIÓN. M. Carda, S. Rodríguez, F. González, J. Murga, E. Falomir, E. CASTILLO, Publicaciones de la Universitat Jaume I, Castellón, 1996.
4. SAFETY IN ACADEMIC CHEMISTRY LABORATORIES: VOLUME 1 y 2. ACCIDENT PREVENTION FOR FACULTY AND ADMINISTRATORS, 7ª Ed. American Chemical Society, Washington, DC, 2003

Journals

Organic Syntheses: http://www.orgsyn.org/
The Journal of Organic Chemistry: http://pubs.acs.org/journal/joceah
Organic Letters: http://pubs.acs.org/journal/orlef7
European Journal of Organic Chemistry: http://www3.interscience.wiley.com/journal/27380/home
Tetrahedron: http://www.sciencedirect.com/science/journal/00404020
Organic and Biomolecular Chemistry: http://www.rsc.org/Publishing/Journals/Ob/Index.asp
The Journal of Chemical Education: http://jchemed.chem.wisc.edu/

Web sites of interest

Organic Chemistry Portal: http://www.organic-chemistry.org/
Organic Resources Wordwide: http://www.organicworldwide.net/
Bases de datos de compuestos orgánicos: http://pubchem.ncbi.nlm.nih.gov/ , http://www.chemspider.com/

OBSERVATIONS