1. OVERVIEW

Subject Area	Organic Chemistry
Degree	Bachelor's Degree in Biotechnology
School/Faculty	School of Biomedical and Health Sciences
Year	Second
ECTS	6
Type	Core
Language(s)	English
Delivery Mode	On campus
Semester	1
Academic Year	25 - 26
Coordinating professor	Viviana Negri
Teacher	Cristina Blázquez Barbadillo

2. INTRODUCTION

Organic Chemistry is part of the Chemistry module taught in the first cycle of the Degree in Biotechnology. It is a core subject and is worth 15 ECTS, divided over years 1 (General Chemistry) and 2 (Organic Chemistry).

Organic Chemistry is one of the core subjects worth 6 ECTS and is delivered in the first semester of the second year of the Bachelor's Degree in Biotechnology. The overall objective of this subject area is to teach students the basic aspects of chemistry that are most relevant to biotechnology.

The aim of this subject area is for students to expand their knowledge of chemistry beyond that acquired from their high school studies. The knowledge and skills acquired will provide students with the chemical foundations required to carry out subsequent studies with a high level of autonomy.

Organic Chemistry is the branch of chemistry which studies the structure and reactivity of carbon compounds known as organic molecules. Among these molecules are the greater part of the compounds involved in biological processes, as well as the immense majority of the compounds which possess pharmacological activity and provide the base for medicines. The main aim of this subject area is to teach students the general aspects associated with the bonding, structure and reactivity of organic compounds. It also aims to teach the synthesis and reactivity of the main functional groups present in molecules which take part in biological processes.

3. LEARNING OUTCOMES (RA, by the acronym in Spanish)

Knowledge (CON, by the acronym in Spanish)

CON01. Describe organic compounds, their properties and basic formula and the function of chemical elements in metabolic processes.

- Acquire knowledge about organic compounds regarding their classification into homologous structural families, structure, behaviour and physicochemical properties, relationships between the groups and principal reaction mechanisms.
- Become familiar with the work involved in an organic synthesis laboratory.

Abilities (HAB, by the acronym in Spanish)

HAB01. Apply acid-base and redox reactions, together with the reaction mechanism of chemical compounds for studying acid-base equilibrium and redox reactions which take place in biological systems.

- Apply knowledge of the atomic structure, nuclear stability, electron configuration, and binding models to the field of biotechnology.
- Achieve spoken and written mastery of the language and terminology of organic chemistry, with flexible knowledge of concepts, technical terms and basic formula.

Skills

COMP04. Identify and analyse the physical and chemical properties of matter and how its structure determines its reactivity and function.

COMP06. Develop the skills needed to use the most common equipment, instruments and basic techniques in biotechnology, following quality standards and current biosecurity regulations.

4. CONTENTS

- Structure and properties of organic compounds. Functional groups. Nomenclature. Types of organic reactions. Reaction intermediates.
- Stereochemistry: Constitutional isomers, conformational isomers and stereoisomerism.
- Study of reactivity and synthesis of alkanes and cycloalkanes, alkenes, alcohols and phenols, ethers and epoxides, amines, aldehydes and ketones, and carboxylic acids and its derivatives.

The subject area is divided into three learning units, which are then divided into topics (three topics per unit):

Learning Unit 1. Introduction to organic compounds

- Topic 1. Structure and properties of organic compounds.
- Topic 2. Stereoisomerism.
- Topic 3. Introduction to the reactivity of organic compounds.

Learning Unit 2. Properties and reactivity of functional groups I

- Topic 4. Alkanes and cycloalkanes.
- Topic 5. Alkenes.
- Topic 6. Alcohols, ethers and derivatives of sulphur.

Learning Unit 3. Properties and reactivity of functional groups II

- Topic 7. Aldehydes and ketones.
- Topic 8. Carboxylic acids and derivatives.
- Topic 9. Amines and nitrogenous compounds.

5. TEACHING/LEARNING METHODS

The types of teaching/learning methods are as follows:

- Lecture.
- Collaborative learning.
- Problem-based learning.
- Learning based on workshops/laboratory work

6. LEARNING ACTIVITIES

The types of learning activities, plus the amount of time spent on each activity, are as follows:

On campus:

Learning activity	Number of hours
Lectures	30
Asynchronous master lectures	15
Debates and discussions	1
Problem-solving	36 (12 on-campus)
Written reports and essays	1
Tutorials	12
Independent working	38
Workshops or laboratory activities	13
On-campus knowledge tests	4
TOTAL	**150**

7. ASSESSMENT

The assessment methods, together with how much they each count towards the final grade for the subject area, are as follows:

On campus:

Assessment system	Weight
Reports and written work	20%
Case study/problem scenario	5%
Laboratory practice	15%
Knowledge tests	60%

On the Virtual Campus, when you open the subject area, you can see all the details of your assessment activities and the deadlines and assessment procedures for each activity.

7.1. Ordinary exam period

To pass the subject area in the ordinary exam period you must obtain a mark of 5.0 or more out of 10.0 in all assessed parts of the subject. Any part you do not pass in the ordinary exam period will need to be recovered in the extraordinary exam period (resits).

Your final grade will be the average of the partial marks in each of the learning activities you have passed. The continuous assessment system for the learning activities requires attendance to at least 50% of the classes.

It is compulsory for students studying degrees on-campus to accredit attendance to at least 50% of classes. This requirement qualifies students for the right to obtain academic counselling, support and monitoring from the professor. Failure to accredit attendance to at least 50% of the classes by any of the means proposed by the University will mean that the professor awarding a fail to the student for that subject area in the ordinary exam period in accordance with the grading system outlined in these regulations. All of the above, without prejudice to the other requirements or higher attendance percentages that other faculties may stipulate in their learning guides or internal regulations. Regulations for the assessment of official degree programmes, Art. 1 point 4.

(*https://universidadeuropea.com/documents/1798/6.__Reglamento_evaluacion_titulaciones_oficiales_grado_UEM_v2.pdf*)

In any case, you must achieve a grade greater than or equal to 5.0 in the objective tests so they can be used for the average with the other activities.

7.2. Extraordinary exam period (resits)

To pass the subject area in the extraordinary exam period (resits), the students must obtain a mark equal to or above 5.0 out of 10.0 in all parts of the subject assessment they did not pass during the ordinary exam period.

The student must submit the activities not passed in the ordinary exam period taking into account the corrections or comments made by the teacher. The student must also submit any activities which were not submitted.

The final grade will be the average of the partial marks in each of the activities passed (with a mark equal to or higher than 5 out of 10). The marks for the assessable activities the student passed in the ordinary exam period will be maintained for calculating this grade.

8. TIMELINE

The timeline with delivery dates of assessable activities in the subject area is indicated in this section:

Assessable activities	Date
Activity 1. Solving applied activities individually or as a group – written texts	Week 2-18
Activity 3. Molecular modelling workshop	Week 7-11
Activity 4. Laboratory practice	Week 3-11
Activity 5. Knowledge tests	Week 7 and 21

The timeline may be subject to modifications for logistical reasons of the activities. Students will be informed of any changes in due time and course.

9. BIBLIOGRAPHY

The reference work for following this subject area is:

- Klein, D. Química Orgánica. Editorial Médica Panamericana.
- Vollhardt, K. Peter C.; Schore, N. E. Química Orgánica. Ediciones Omega S.A.

The recommended bibliography is indicated below:

- Wade, L.G. Química Orgánica. Editorial Pearson Prentice Hall.
- Morrison, R.T.; Boyd, R.N. Química Orgánica. Editorial Pearson Addison Wesley.
- Holum. Fundamentos de Química General, Orgánica y Bioquímica para ciencias de la salud. Editorial Limusa Wiley.
- Soler, V., González, M. E. Química Orgánica para ciencias de la salud. Editorial Síntesis.
- García F., Dobado, J.A. Problemas resueltos de química orgánica. Editorial Thomson.

Relevant websites:

- https://www.quimicaorganica.org/
- http://www.quimicaorganica.net/

10. EDUCATIONAL GUIDANCE AND DIVERSITY UNIT

The Educational Guidance and Diversity Unit (ODI in Spanish) offers support throughout your time at university to help you with your academic achievement. Other cornerstones of our educational policy are the inclusion of students with special educational needs, universal access in all our university campuses and equal opportunities.

This ODI unit offers students:

1. Support and monitoring through counselling and personalised student plans for those who need to improve their academic performance.
2. Curricular adaptations to uphold diversity, with assistance for those students who require specific educational support, leading to equal opportunities without significant changes to methodology or evaluation.

3. We offer students a range of extracurricular educational resources to reinforce skills which will enhance their personal and professional development.
4. Career guidance by offering tools and advice to students with doubts regarding their professional careers or those who believe they have chosen the wrong line of study.

Students who need educational support can contact us at:
orientacioneducativa@universidadeuropea.es

11. SATISFACTION SURVEYS

Your opinion matters!

Universidad Europea encourages you to complete our satisfaction surveys to identify strengths and areas for improvement for staff, degree courses and the learning process.

These surveys will be available in the surveys area of your virtual campus or by email.

Your opinion is essential to improve the quality of the course.

Many thanks for taking part.