

27111 - Organic Chemistry

Información del Plan Docente

Academic Year	2018/19
Subject	27111 - Organic Chemistry
Faculty / School	100 - Facultad de Ciencias
Degree	446 - Degree in Biotechnology
ECTS	6.0
Year	
Semester	Half-yearly
Subject Type	Compulsory
Module	---

1.General information

1.1.Aims of the course

1.1 The course respond to the following approaches and objectives:

1. To provide the student with the set of fundamental tools in Organic Chemistry (structural knowledge of the different organic families and their basic reactivity, stereochemical implications of the products and reagents) in order to understand the biochemical processes from the molecular point of view.
2. To contribute to the creation in the student of a clear conscience about the importance of Organic Chemistry in the transformation processes carried out by living beings in isolated systems or in their cellular or tissue environments, which may allow them, not only interpret the processes, but also design the appropriate modifications to develop applications.

1.2.Context and importance of this course in the degree

The subject of Organic Chemistry aims to provide students with an overview of organic compounds, the chemical processes in which they participate and their application to the understanding of biological processes. Organic Chemistry is fundamental to understand the matters related to the interaction between chemistry and biochemical processes.

1.3.Recommendations to take this course

It is recommended that the student has completed and passed the General Chemistry degree of Biotechnology.

It is fundamental to review the knowledge acquired in the aforementioned subject, in terms of the basic nomenclature of Organic Chemistry, distinction of functional groups or practical aspects of basic manipulations in the laboratory and in terms of a safe way of working in the laboratory.

The usual attendance to the classes as well as the continued study of the subject is fundamental to facilitate the understanding of it.

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Active participation of students in the classroom is recommended

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as: lectures and practice sessions.

The students are expected to participate actively in the class throughout the semester.

Classroom materials will be available via Moodle. These include a repository of the lecture notes used in class, the course syllabus, as well as other learning resources such as news related with Biotechnology.

Further information regarding the course will be provided on the first day of class.

4.2.Learning tasks

The course includes the following learning tasks:

- Lectures: (3.5 ECTS). It is based in the acquisition of basic knowledge on Organic Chemistry. This activity is developed in 35 hours.
- Practice sessions: (1.9 ECTS). The lectures devoted to solve problems in practical cases which could be developed individually or in groups depending on the proposed case. It is compulsory the participation of the students. It is also fundamental the correct interpretation of the experimental results. (0.6 ECTS).
- Tutorials: The particular questions could be solved in tutorial activities in both individual or small groups.

The material used in the lectures as well as some complementary resources will be available to the student in the Digital Teaching Ring.

Some activities devoted to solving problems and practical questions could be developed in small groups. This activity will involve 19 hours.

4.3.Syllabus

The course will address the following topics:

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- **BASIC CONCEPTS IN ORGANIC CHEMISTRY.**

NOMENCLATURE.

STEREOMERISM: Conformation and configuration in Organic Chemistry. Constitutional isomers and stereoisomers.

CHARACTERIZATION OF ORGANIC COMPOUNDS. SPECTROSCOPIC METHODS.

ORGANIC REACTIONS: Classification. Reaction mechanisms. Reaction intermediates. Thermodynamic and Kinetic control in organic reactions. Acids and bases, Electrophiles and nucleophiles.

- **REACTIVITY OF ORGANIC COMPOUNDS.**

ALKANES AND CYCLOALKANES: Conformational analysis. Radical reactions.

INSATURATED ALIPHATIC HYDROCARBONS: Alkenes and alkynes. Electrophilic additions. Radical additions. Cycloaddition reactions.

AROMATIC HYDROCARBONS: Electrophilic aromatic substitution.

ALKYL HALIDES: Nucleophilic aliphatic substitution SN1 and SN2. Elimination reactions E1 and E2.

ALCOHOLS, PHENOLS AND ETHERS: Activity as nucleophiles. Elimination and oxidation reactions.

AMINES AND ANILINES: Activity as nucleophiles. Diazonium salts.

CARBONYL COMPOUNDS: Aldehydes and ketones. Nucleophilic addition.

CARBOXYLIC ACIDS AND DERIVATIVES: Nucleophilic substitution. Reduction reactions. Activity of enolates as nucleophiles.

BIOORGANIC CHEMISTRY.

The contents related with this subject will be addressed in the previous ones as specific examples.

4.4. Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the Facultad de Ciencias website <https://ciencias.unizar.es/grado-en-biotecnologia>

4.5. Bibliography and recommended resources