

27111 - Organic Chemistry

Syllabus Information

Academic year: 2024/25

Subject: 27111 - Organic Chemistry

Faculty / School: 100 - Facultad de Ciencias

Degree: 446 - Degree in Biotechnology

ECTS: 6.0

Year:

Semester: Second semester

Subject type: Compulsory

Module:

1. General information

To provide the student with a set of fundamental tools in organic chemistry (structural knowledge of the different organic families and their basic reactivity, stereochemical implications of products and reagents) in order to be able to understand and manage biochemical processes from the molecular point of view.

To contribute to the creation in the student of a clear awareness of 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 can allow them not only to interpret the processes, but also to design the appropriate modifications to develop applications.

These approaches and objectives are aligned with the following Sustainable Development Goals (SDG) of the United Nations Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>), in such a way that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to their achievement: ODS 2- 7,9,11,13

2. Learning results

In order to pass this subject, the students shall demonstrate they has acquired the following results:

- To be familiar with the usual techniques in synthesis, isolation and purification of organic compounds.
- To predict the reactivity of a compound based on its functional group, structure and substituents.
- To predict the outcome of a reaction, given the reactants and reaction conditions, and analyse the stereochemical implications, if any.
- To solve problems involving sequences of reactions where it is requested to propose synthetic routes for an organic compound from simpler ones (retrosynthetic analysis).
- To identify characteristic organic functional groups in biological molecules and predict their structure, properties and reactivity.

3. Syllabus

The training activities will follow this content program:

- *Basic concepts of organic chemistry.*
- *Molecular structure.* Chemical bonding in organic compounds
- *Classification and nomenclature* of organic compounds. Functional groups
- *Conformation and configuration.* Stereochemistry and chirality.
- *Characterization of organic compounds.* Spectroscopic methods.
- *Reactivity of organic compounds:*
- Alkanes and cycloalkanes. Radical halogenation reactions.
- Alkenes and alkynes. Electrophilic addition reactions.
- Reactions of delocalized systems.
- Aromatic compounds.
- Properties and reactivity of alcohols, phenols and ethers.
- Amines and other nitrogen derivatives.
- Aldehydes and ketones
- Carboxylic acids and derivatives.

4. Academic activities

- Participative sessions in large groups, in which the various sections of the program will be discussed, combining

theoretical explanations with applications to concrete cases. (3,5 ECTS)

- Specific sessions of problems and case studies in which questions and problems are proposed to be worked by students individually or in groups as appropriate (1,9 ECTS)
- The possible doubts or questions that may arise in the case of individuals or small groups of students will be answered in the corresponding tutoring sessions.
- Two practical sessions as an introduction to experimental work in the laboratory (0.6 ECTS)

5. Assessment system

In order to pass the subject, the student must demonstrate they has acquired the foreseen learning results by the following assessment activities:

- The assessment of the student's learning throughout the term by solving problems and theoretical-practical questions proposed by the teacher in the theoretical classes. (10% of the final grade).

- Completion of face-to-face written test at the end of the semester on the contents taught in the subject. The evaluation of this activity will account for 80% of the final grade. This test will consist of the resolution of exercises and questions and will be based on class notes or books recommended for the subject.

- Assessment of the practices carried out, as well as of the scripts related to the laboratory practices and answers to the questions posed. (10% of the final grade).

In addition to the assessment system previously mentioned, the student will have the possibility to be evaluated in a global test, which will assess the achievement of the learning results indicated above.

In any case, for the sum of the final grade, it will be necessary to achieve a minimum grade of 5 points in the face-to-face and written test at the end of the semester.

6. Sustainable Development Goals

4 - Quality Education

9 - Industry, Innovation and Infrastructure

11 - Sustainable Cities and Communities