

27215 - Organic Chemistry II

Syllabus Information

Academic year: 2023/24

Subject: 27215 - Organic Chemistry II

Faculty / School: 100 - Facultad de Ciencias

Degree: 452 - Degree in Chemistry

ECTS: 12.0

Year: 3

Semester: Annual

Subject type: Compulsory

Module:

1. General information

The objective of this subject is to broaden and deepen the study of the most important functional groups, their transformations and their usefulness in the construction of molecules of medium complexity, to understand the importance of selectivity in chemical reactions, to know some of the fundamental compounds for life and to be able to carry out the corresponding synthetic processes in the laboratory.

These objectives are aligned with the following Sustainable Development Goals (SDGs):

- Goal 3: Health and wellness
- Goal 4: Quality education
- Goal 7: Affordable and non-polluting energy
- Goal 9: Industry, Innovation and Infrastructure

The knowledge acquired is fundamental for the understanding of subjects of the advanced module, as well as for the realization of several Degree Final Projects.

To take this subject it is mandatory to have taken Organic Chemistry I.

2. Learning results

Upon completion of the subject, the student will be able to:

- Know and master in an integrated way the reactivity of organic compounds and their main reaction mechanisms
- Know the reactions of transformation of functional groups and creation of carbon skeletons.
- Design synthetic strategies that selectively lead to the types of compounds studied.
- Know the chemistry of biological and industrial organic compounds of major interest.
- Solve questions and problems on the above aspects in a reasoned and critical way.
- Perform synthetic processes, isolation and characterization of organic compounds.

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

- Understanding of the structure and reactivity of organic compounds, including mechanistic and stereochemical aspects.
- Prediction of the products of a given reaction, taking into account its various facets of selectivity.
- Proposal of synthetic processes leading to the obtention of moderately complex compounds.
- Analysis and execution of synthetic, isolation and purification procedures, as well as interpretation of characterization data.

3. Syllabus

1. Enols and enolates.
2. Alkylation of enolates.
3. Reaction of enolates with aldehydes and ketones.
4. Enolate acylation.
5. Conjugated addition of enolates.
6. Phosphorus compounds.
7. Sulphur compounds.
8. Silicon compounds.
9. Reductions.

10. Oxidations.
11. Heterocyclic compounds.
12. Carbohydrates.
13. Amino acids, peptides and proteins.

4. Academic activities

The learning process designed for this subject is based on:

- Acquisition of theoretical knowledge: Lectures and participatory classes (60 classroom hours).
- Problem solving: Face-to-face classes to solve proposed problems and discuss their solutions (30 hours, small groups).
- Laboratory practices: Practices related to the topics studied in the theoretical part (30 hours, 2 h of seminars and 28 h of practical sessions).

5. Assessment system

The evaluation of the subject will be carried out by continuous evaluation based on the **Laboratory** (20 %) and **Theory and Problems** (80 %), which will be passed separately.

The **laboratory** activities will be evaluated according to the preparation and quality of the work done in the laboratory, to the resolution of problems and questions related to the practices and to the accomplishment of a written test with contents of the practices of the subject.

The **Theory and Problems** activities will be evaluated considering the grades obtained in problem solving sessions, in class or in writing, or in other activities (20 %), and of a midterm exam (80 %), in each semester, which will consist of the resolution of problems and theoretical-practical questions. Semesters may be passed independently, by obtaining a grade higher than 4 in the corresponding midterm exam.

The grades for **Laboratory** and each semester of **Theory and Problems** will be kept within the same academic year.

In case of failing any part of the subject, or wanting to improve the grade obtained, every student will have the right to a final **laboratory** and/or **Theory and Problems** final exam (a single exam that will include material from both semesters).