

27237 - Industrial Organic Chemistry

Syllabus Information

Academic year: 2023/24

Subject: 27237 - Industrial Organic Chemistry

Faculty / School: 100 - Facultad de Ciencias

Degree: 452 - Degree in Chemistry

ECTS: 5.0

Year: 4

Semester: Second semester

Subject type: Optional

Module:

1. General information

The subject has the following objectives:

- To provide an applied view of organic chemistry and to connect raw material sources, industrial synthetic processes and applications of organic compounds and materials.
- To introduce the student to the main types of organic compounds produced in the chemical industry and their importance in society.
- To provide a critical view of the benefits and problems derived from Industrial Organic Chemistry.

These approaches and objectives are aligned with the Sustainable Development Goals (SDGs) of the 2030 Agenda of United Nations (<https://www.un.org/sustainabledevelopment/es/>), the learning results of the subject will contribute to the achievements of Goals 1, 2, 3, 4, 6, 7, 8, 9, 11, 12 and 13.

2. Learning results

To pass this subject, students must demonstrate the following results:

- Know the sources of energy and raw materials and the main industrial synthetic processes of the most consumed organic products and their applications.
- Relate the main industrial sectors that are based on the development or transformation of materials of organic origin.
- Understand and applies basic knowledge of general chemistry and organic chemistry to the chemical industry.
- Make critical judgments, with scientific basis, on the benefits of Industrial Organic Chemistry, derived problems and proposed alternatives.
- Value and recognize the potential of sustainable chemistry in terms of the use of renewable sources of raw materials and the reduction of polluting substances.
- Recognize the importance of organic chemistry within science and its impact on today's society. Consults and uses the bibliography proposed for the development of the subject.
- Prepares and defends bibliographic research papers.

3. Syllabus

- Overview of the chemical industry in the world.
- Overview of the chemical industry in Spain.
- Basic chemicals derived from petroleum and natural gas.
- Ethylene and its derivatives.
- Propylene and its derivatives.
- C4 fraction and its derivatives.
- BTX fraction and its derivatives.
- Coal derivatives and other sources.
- Renewable raw material sources.
- Industrial catalysts.
- The polymer and ancillary industries.
- Pharmaceutical chemistry.
- Agrochemicals.
- Food industry.
- Surfactants. Detergents.
- Dyes and pigments.

- Cosmetics and hygiene.
- Perfumes.
- Paper and derivatives industry.
- Explosives, propellants and detonators.
- Oenology.
- Adhesives.
- Chemicals and environmental pollution.

4. Academic activities

Master classes: 35 hours. The topics of the subject's syllabus will be explained.

Problems and cases: 10 hours. Theoretical-practical problems on the contents of the subject.

Teaching assignments: 20 hours. Elaboration of papers on current topics related to Industrial Organic Chemistry. Follow-up tutorials.

Special practices: 5 hours. Visit to a company in the sector.

Study and personal work: 50 hours.

Assessment tests. 5 hours.

5. Assessment system

The final grade for the subject will be the best of the grades obtained by the student between two alternative formulas.

Formula 1

- Works: Preparation, oral presentation and discussion of individual or group work on topics of the subject.

Student attendance and participation in the discussion will also be valued. Contribution to the final grade: **30%**.

- Participation in programmed visits to industries: Active participation, interest and subsequent discussion will be valued.

Contribution to the final grade: **5 %**.

- Class participation: The student's attitude and active participation in class and in the rest of face-to-face activities, including seminars by external specialists, will be considered. Contribution to the final grade: **5 %**.
- Final written test: Mandatory for all students. It will consist of a series of questions and exercises of application on the topics of the subject and on the contents of the class seminars and the visit to an industry. Contribution to the final grade: **60 %**.

The subject will be considered passed if the weighted average of the four grades according to the percentages indicated is equal to or higher than 5.

Formula 2

Final written test, with the characteristics described for the formula 1 final written test. It will account for **100%** of the final grade.