

29931 - Industrial Chemistry

Syllabus Information

Academic year: 2023/24

Subject: 29931 - Industrial Chemistry

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 435 - Bachelor's Degree in Chemical Engineering

ECTS: 6.0

Year: 4

Semester: First semester

Subject type: Compulsory

Module:

1. General information

The main goal of the subject is that the student knows the processes of the chemical industry. For this purpose, a scientific, technological, environmental and economic analysis of these processes is made at . It also aims to be able to synthesize and apply the knowledge acquired in the degree to the industrial reality. Finally, it is intended that the student poses and solves problems of matter and energy balances.

These approaches and goals are aligned with the Sustainable Development Goals, SDGs, of the 2030 Agenda (<https://www.un.org/sustainabledevelopment/es/>) and some targets, specifically Goal 7, Objectives 7.2 and 7.3; Goal 9, Objective 9.4 and Goal 12, objectives 12.4 and 12.5.

2. Learning results

- Master the resolution of problems related to the design, operation and optimization of chemical industrial equipment.
- Propose and analyze alternatives to carry out a process, taking into account thermodynamic and kinetic aspects of it, as well as the stages involved
- Solve problems of matter and energy balances in chemical processes.
- Identify needs for product development.
- Identify environmental problems associated with a chemical process and propose alternatives and/or solutions.

3. Syllabus

The program of the subject is subdivided into theoretical classes and problem solving.

Unit 1. Introduction.

Unit 2. Sulfuric Acid Production.

Unit 3. Ammonia production.

Unit 4. Nitric Acid Production.

Unit 5. Synthesis Gas and Hydrogen Production.

Unit 6. Petroleum and Petroleum Refinery.

Unit 7. Petroleum Refining Processes.

Unit 8. Petrochemical processes. Production and use of Olefins.

Unit 9. Enzymatic and microbial processes. Industrial bioreactors.

Unit 10. Industrial bioprocesses.

4. Academic activities

Lectures (40 h) where the theory of the different topics that have been proposed will be taught and problems will be solved model.

Problem solving classes and cases (20 h). Problems of matter and energy balances in steady state and non steady state.

Application work (20 h), individual or in groups. Different themes will be proposed by the teachers. Students' proposals may be accepted at.

Individual study (64 h).

Assessment (6 h).

5. Assessment system

The student must demonstrate that he/she has achieved the expected learning results by means of the following activities assessment activities.

Option 1:

The assessment is global and includes:

1. Assignments (20% of the final grade): The deliverables corresponding to papers will be graded on the basis of their content, creativity, understanding of concepts and presentation.
2. Final test (80% of the final grade): It will consist of a written test, to be taken during the test period, with a theoretical part and a problem part. Assess all the knowledge seen in the classes.

The theoretical part will consist of three applied questions. The practical part will consist of two balance problems of numerical resolution. Each of the parts accounts for 50% of the test grade, being necessary to obtain a minimum score of 4.0 out of 10 in the final test grade to average with the tutored work.

For both parts of the test, the student will be able to consult help material.

Option 2:

Those students who do not wish to follow the assessment of option 1, may choose to take only the final test (100% of the final grade).