

27222 - Chemical Industry: Processes, Hygiene and Safety

Syllabus Information

Academic year: 2023/24

Subject: 27222 - Chemical Industry: Processes, Hygiene and Safety

Faculty / School: 100 - Facultad de Ciencias

Degree: 452 - Degree in Chemistry

ECTS: 6.0

Year: 4

Semester: First semester

Subject type: Compulsory

Module:

1. General information

The objective of this subject is that the students develop the necessary skills and abilities to analyze with criteria representative chemical processes of the Chemical Industry from the point of view of consumption of raw materials and energy sources, product yields, emissions and discharges, safety aspects in the facilities, occupational hygiene and regulatory framework.

These approaches and objectives are aligned with Sustainable Development Goals (SDGs) 7, 9, 12 and 13 of the United Nations' Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>).

2. Learning results

- Explain reasonably, using basic concepts of transport phenomena, kinetics and thermodynamics, the main operations of representative chemical processes in the chemical industry.
- Manage the basic terminology and nomenclature in the field of Hygiene, Safety and Environment in the Chemical industry.
- Identify and evaluates the main emissions that a given industrial activity can generate.
- Identify and evaluates the health and safety risks of a given industrial activity.
- Apply basic Environmental, Safety and Hygiene regulations to Industrial Chemical Processes.
- Work in a team in an organized and planned manner, sharing information and knowledge with others to contribute to a common project.

3. Syllabus

Block I. Industrial Chemical Processes

1. Chemical Processes today.
2. Introduction to Instrumentation and Control of Industrial Chemical Processes.
3. Representative Industrial Chemical Processes.

Block II. Safety and Hygiene in the Chemical Industry

1. Introduction.
2. Industrial Safety. Flammability. Fires and explosions. Characteristics, types and empirical models and maps of vulnerability. Leakage of toxic and flammable substances.
3. Industrial Hygiene. General concepts. Classification of Adverse Agents. Toxicity. Exposure Limits Professional for Chemical Agents. Control of the presence of contaminants in work environments: general ventilation and localized exhaust.

4. Academic activities

Block I. Industrial Chemical Processes

- Theoretical master classes with the entire group: 15 h
- Problem-solving master classes with the entire group: 5 h
- Problem-solving master classes with the entire group: 5 h
- Classroom problem solving classes: 5 h

Block II. Safety and Hygiene in the Chemical Industry

- Theoretical master classes with the entire group: 15 h
- Problem-solving master classes with the entire group: 5 h

- Problem-solving master classes with the entire group: 5 h
- Classroom problem solving classes: 5 h

Tutored Work: 21 h

Personal Study: 63 h

Evaluation Tests 6 h

5. Assessment system

The student must demonstrate achievement of the intended learning results through the following assessment activities:

- Test 1. Written exam, on the dates established for the official exams, which will consist of a part of theoretical-practical questions and a part of problems (60% of the final grade, minimum 5 out of 10).
- Test 2. Delivery, presentation and defence of the work done in group (2-3 students, 40 % final grade, minimum 5 out of 10). The grading of the written report of the work is joint for the whole team, but the grade for the presentation and defense is individual. Students will choose the topics for the assignments from among those proposed by the faculty at the beginning of the term and will submit the corresponding monitoring forms throughout the term. Those students who have not satisfactorily passed this test during the term will be evaluated on an individual paper during the global evaluation period.
- Class participation and delivery of individually solved problems throughout the term (up to a maximum of 1 point to be added to the final grade).