

## 29904 - Chemistry

### Syllabus Information

**Academic year:** 2024/25

**Subject:** 29904 - Chemistry

**Faculty / School:** 110 - Escuela de Ingeniería y Arquitectura

**Degree:** 435 - Bachelor's Degree in Chemical Engineering

**ECTS:** 6.0

**Year:** 1

**Semester:** 435-First semester o Second semester

330-First semester

107-First semester

**Subject type:** Basic Education

**Module:**

### 1. General information

These are the approaches and goals of the subject:

- To give students an overview of chemistry and its importance in society .
- To provide the basis of knowledge about the structure and composition of matter and its transformations
- To learn the basic rules to be followed in a chemistry laboratory and to carry out experiments involving chemical and physical transformations
- Students should be able to apply theoretical and practical knowledge of chemistry in future terms and in the development of their profession as engineers

### 2. Learning results

- Master the basic principles of chemistry: nomenclature, stoichiometry, mass balance, etc.
- Master the basic laws that regulate reactions: thermodynamics, kinetics and equilibrium equilibrium.
- Solve exercises and problems in a complete and reasoned way.
- Properly apply theoretical concepts in the laboratory through the correctly and safely use of basic material and equipment.
- Use rigorous language in chemistry.
- Present and interpret data and results.

### 3. Syllabus

- Unit 1. Introduction (1 h).
- Unit 2. Formulation review (inorganic and organic) (2 h).
- Unit 3. Chemical reactions. Types and stoichiometry (3 h)
- Unit 4. Units and balances (5 h).
- Unit 5. Chemical thermodynamics (3 h).
- Unit 6. Entropy, free energy and chemical equilibrium (5 h).
- Unit 7. Phase change equilibria (4 h).
- Unit 8. Physical properties of solutions (5 h).
- Unit 9. Acid-base equilibria (3 h).
- Unit 10. Solubility and complex formation equilibria (3 h).
- Unit 11. Electrochemistry (6 h).
- Unit 12. Chemical kinetics (5 h).

### 4. Academic activities

The 6 ECTS subject requires a dedication of 150 hours of work on the part of the student. The approximate time distribution corresponds to the following planning of activities of teaching-learning:

- Master class (25 h).
- Problem solving (20 h).
- Laboratory practices (10 h).
- Supervised work (15 h). Includes 3 h of presentations made by students at class time.
- Personal study (75 h). This includes the study of the subject taught in the master class, problem solving and preparation of laboratory practices.

In addition, it can be complemented with support classes that will be scheduled at the beginning of the term.

- Assessment tests (5 h). 2 h corresponding to the first partial and 3 h corresponding to the test scheduled in the "test band" of January-February.

## 5. Assessment system

1. **Completion of all laboratory practices.** The fulfillment of the assignments and the completion of a written test will be assessment. 10% of the grade.
2. **Group work** (2-3 students) and oral presentation (10%).
3. **Midterm eliminatory exam**, theory and problems, in principle, from Introduction (Unit 1) up to Phase change equilibria (Unit 7), both included (40%). If the grade obtained in this test is less than 5, the student should take the final test to be assessment himself/herself for the whole subject.
4. **Second midterm exam** (40%), coinciding with the final test (80%). This test will be adapted to assessment 100% of the subject (including internships).

Tests 1 to 3 will be during the class period, test 4 during the test period. In order to pass the second midterm exam or the final test, a grade higher than 4 must be obtained, both in theory and in problems, as long as the other components of the assessment (practicals, group work and first partial exam) have more than 5. Students who are registered as no-shows for the internship must take the final test at , as well as those who want to improve their internship grade. There will be no possibility to re-assessment the group work in the final test. The student will be entitled to the highest weighted grade resulting from including or not including the group work grade. Finally, the grades of the first and second partial exams for the second call will not be savedat.

## 6. Sustainable Development Goals

- 9 - Industry, Innovation and Infrastructure
- 12 - Responsible Production and Consumption
- 13 - Climate Action