

## 29915 - Experimentation in Chemistry

### Syllabus Information

**Academic year:** 2023/24

**Subject:** 29915 - Experimentation in Chemistry

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

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

**ECTS:** 6.0

**Year:** 2

**Semester:** Second semester

**Subject type:** Compulsory

**Module:**

### 1. General information

The purpose of this subject is to **acquire the knowledge and skills necessary in a chemical laboratory** .

The **goals** are that students

- acquire the necessary skills in the manipulation of chemical reagents and usual instruments in a chemistry laboratory, - reach a better understanding of the theoretical-practical knowledge previously acquired by applying it to experimental processes in a chemical laboratory and
- interpret and mathematically treat the results obtained in a correct way, including their presentation in a clear and orderly manner.

These approaches and goals are aligned with the Sustainable Development Goals of the 2030 Agenda of the United Nations, so that the acquisition of the learning results of the subject will contribute to some extent to the achievement of objective 9.5 of Goal 9.

### 2. Learning results

- Adequately apply the theoretical and practical concepts in the development of chemical analysis and processes in the laboratory.
- Use rigorous language in chemistry.
- Interpret and present data and results appropriately.

### 3. Syllabus

**Analytical Chemistry:** Analytical determinations based on:

- acid-base, complex formation and oxide-reduction equilibria
- gravimetric techniques
- instrumental analysis techniques

**Physical Chemistry:**

- Study of phase equilibria in pure substances, binary and ternary systems
- Conductimetric evaluations
- Corrosion studies
- Determination of surface tension in liquids

**Inorganic Chemistry:**

- Preparation and study of lead compounds, ferrosilicon, silica gel, copper salts, silver mirror, cis-trans-copper geometric isomers, halogens, NaHCO<sub>3</sub> cis-trans isomers of copper, halogens, NaHCO<sub>3</sub> and Na<sub>2</sub>CO<sub>3</sub>

**Organic Chemistry:**

- Acid-base, SN1 vs. SN2, esterification and reduction reactions
- Preparation of colorants
- Separation of organic compounds

### 4. Academic activities

Laboratory internship **60 h/student**

**15 h of face-to-face work in each Department** (Analytical Chemistry, Physical Chemistry, Inorganic Chemistry and Organic Chemistry), organized as 5 practical sessions of 3h each, in two "batches" during the second four-month period and according

to the calendar/schedule set by the center.

Chemical reagents and the necessary instrumentation will be used to develop the different analysis (analytical chemistry) and chemical processes/reactions (inorganic, organic and chemical-physical), proposed in the different practice scripts.

## 5. Assessment system

In this subject an **exceptional system of continuous** assessment is considered **according to Art 9. Point 4) of the assessment of the University of Zaragoza**, which allows the student to obtain the 100% of the grade in the subject in the first call, from which the global assessment test is excluded.

Each Department will assess the practical sessions for which it is responsible. Each session of laboratory will be followed up and the previous preparation, development, presentation and interpretation of the results obtained will be evaluated.

The final grade of the subject will be the average grade of the grades obtained in each of the Departments, provided that (grade 5.0 or higher) are passed in at least two Departments and the subject is compensable (grade 4.0 or higher) in a maximum of two Departments.

In order to pass the subject, the average grade must be 5.0 or higher.

The possibility of a written test is contemplated. Departments that decide to do so will report it in their first laboratory session. If an test is taken, a minimum grade of 3.0 will be required, and will account for 30% of the grade . If this grade is not achieved, the student will be considered failed in the part corresponding to that Department.

For those students who do not take the first test (or have failed it), the Center, during the established period of extraordinary exams, will schedule a date for a global test of theoretical-practical character that will be 100% of the student's grade.