COURSE DATA

DATA SUBJECT

Code: 36897
Name: Experimental Techniques in the Chemical Industry-Dual Mention
Cycle: Undergraduate Studies
ECTS Credits: 12
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
1110 - Degree in Chemistry	Facultat de Química	4	Annual

SUBJECT-MATTER

Degree	Subject-matter	Character
1110 - Degree in Chemistry	Química Industrial Aplicada	ELECTIVES

COORDINATION

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SUMMARY

Experimental Techniques in the Chemical Industry is a 12 ECTS subject that is part of the Applied Industrial Chemistry subject. This is one of the subjects that students will take within the dual major of the degree in Chemistry.

The subjects that make up this subject aim to address scientific-technical, applied and practical aspects, which provide students with the knowledge, skills and competencies to practice the profession of Chemist in a fundamentally industrial context.

In addition, this subject will expand and strengthen the most practical aspect of Chemistry, preparing students to successfully address their specialization in the field of Chemistry and, fundamentally, to practice the profession of chemist in quality control and research laboratories and I+D+i of the chemical industry.

The student will be introduced to the dynamics of a company, which will allow them to learn about the internal functioning of a company and assume tasks typical of the profession as a chemist. Obviously, the student will be closely supervised by the business and academic tutors, and will be able to carry out more work.

In relation to the Sustainable Development Goals (SDGs), in this subject, students are expected to be able to apply the knowledge they have learned to contribute to ensuring inclusive, equitable, and quality education and promoting lifelong learning opportunities for all (SDG 4), to acquire a special sensitivity for the sustainable management of water (SDG 6), raw materials, and energy sources (SDG 7), as well as for sustainable and environmentally compatible development (SDGs 11, 12, 13, 14, and 15), in addition to being able to design, select, and/or develop efficient products, chemical processes, and/or analytical methodologies (SDG 7) that minimize their impact on the environment (SDGs 14 and 15), utilize alternative raw materials, and generate less waste (SDG 11).

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

To successfully approach the subject, it is advisable that the student have solid knowledge of chemistry and statistics and have passed the degree subjects from previous courses.
In order to take the subject, the student must have been selected to enroll in the Degree in Chemistry - Dual Mention option.

COMPETENCES / LEARNING OUTCOMES

1110 - Degree in Chemistry

Act autonomously in learning, making informed decisions in different contexts, forming judgements based on experimentation and analysis, and transferring knowledge to new situations.

At the end of the course, the student will be able to address new problems and develop strategies to solve them.

At the end of the course, the student will be able to apply metrology in chemical processes, including quality management.

At the end of the course, the student will be able to assess risks in the use of chemical substances and laboratory procedures.

At the end of the course, the student will be able to distinguish between qualitative and quantitative aspects of chemical problems.

At the end of the course, the student will be able to distinguish the principles, procedures and techniques used for the determination, separation, identification and characterisation of chemical compounds.

At the end of the course, the student will be able to identify chemical elements and compounds, including their production, structure, reactivity, properties and applications.

At the end of the course, the student will be able to identify chemical processes in everyday life.

At the end of the course, the student will be able to identify the main types of chemical reactions and their key characteristics.

At the end of the course, the student will be able to identify the unit operations of chemical engineering.

At the end of the course, the student will be able to implement sustainable and environmentally friendly methodologies.

At the end of the course, the student will be able to prepare reports, expert assessments and industrial and environmental projects in the field of chemistry.

At the end of the course, the student will be able to relate theory and experimentation.

At the end of the course, the student will be able to solve problems effectively.

At the end of the course, the student will demonstrate inductive and deductive reasoning skills.

At the end of the course, the student will demonstrate the ability to analyse, synthesise and apply critical reasoning.

At the end of the course, the student will interpret the relationship between the variation of the characteristic properties of chemical elements and the periodic table.

At the end of the course, the student will relate chemistry to other disciplines.

Collaborate effectively in teams, assuming responsibilities and leadership roles and contributing to collective improvement and development.

Communicate effectively, both orally and in writing, adapting to the characteristics of the situation and the audience.

Contribute to the design, development and implementation of solutions that address social needs, taking the Sustainable Development Goals as a reference.

Demonstrate critical and self-critical reasoning within the field of study, considering aspects such as professional ethics, moral values and the social implications of the different activities undertaken.

Express oneself correctly, both orally and in writing, in any of the official languages of the Valencian Community.

Propose creative and innovative solutions to complex situations or problems within the field of study, in order to respond to diverse professional and social needs.

Understand and recognise, from within the discipline, inequalities based on sex and gender in society; integrate different needs and preferences related to sex and gender into problem-solving and solution design.

DESCRIPTION OF CONTENTS

1. CHEMICAL ANALYSIS IN THE CHEMICAL INDUSTRY

Chemical analysis of products from the main industrial sectors. Analytical control of raw materials, the production process and finished products. Analytical applications related to current industrial sectors.

2. ENVIRONMENTAL CHEMICAL ANALYSIS

Analysis of environmental samples. Bioanalysis. Environmental chemical analysis. Analytical applications in atmospheric samples, water, soils, biota.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Internship	120,00
Total hours	**120,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	0,00
Preparation of lessons	0,00
Preparation for assessment activities	0,00
Resolution of case studies	0,00
Total hours	**0,00**

TEACHING METHODOLOGY

Each student will be assigned a company tutor and an academic tutor. The company tutor will be assigned by the collaborating entity and the academic tutor will be assigned by the faculty of chemistry at the proposal of the Dual Mention Committe. Both tutors will coordinate the development of the activities established in the training project and will be in contact to solve any doubt or problematic situation.

Within the program of the subject the types of teaching activities that can be developed will be mainly:

Lecture class.

Practical class.

Participative class.

Field trip/guided visit.

Exercise resolution.

Reading/commentary of texts.

Seminar.

Debate.

Search for information.

Attendance at external events.

Problem-based learning.

Case study/analysis.

Oral presentations.

Certain activities, such as tutoring with an academic advisor, independent student work, seminars, and activities related to the acquisition of transversal skills, could be carried out both in the company and at the Faculty of Chemistry.

EVALUATION

The assessment will be carried out through a continuous assessment system in which both the business tutor and the academic will be involved. The system is based on the assessment of skills, abilities and knowledge acquired by students. The activity developed can be evaluated through:
1. Follow-up reports and/or assessment tests that allow students to learn about the acquisition of knowledge, skills and competencies.
2. A rubric agreed between the company tutor and the academic tutor that will be specified in the training plan.
3. The meetings and follow-up interviews carried out between the tutors and the student in which the degree of compliance with the training plan and the skills acquired will be verified.

To pass the subject, the skills acquired will be evaluated using the reports of the company and/or University tutors as indicators, with a weight of 30% of the final grade. In addition, the evaluation meetings, tests and reports of the work carried out during the dual training will be assessed, with a weight of 70% of the final grade.

REFERENCES

The bibliography will be specific to the field in which the student performs the stay and selected by the tutors at the suggestion of the company.