COURSE DATA

DATA SUBJECT

Code: 36897
Name: Experimental Techniques in the Chemical Industry-Dual Mention
Cycle: Undergraduate Studies
ECTS Credits: 12
Academic year: 2025-26

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

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Act autonomously in learning, making well-founded decisions in various contexts, forming judgements based on experimentation and analysis, and applying knowledge to new situations.

Address new problems and propose strategies to solve them.

Apply metrology in chemical processes, including quality management.

Collaborate effectively in work teams, assume responsibilities and leadership roles, and contribute to collective improvement and development.

Communicate effectively both orally and in writing, adapting to the context and audience.

Contribute to the design, development and implementation of solutions that respond to social demands, using the Sustainable Development Goals as a reference.

Demonstrate both inductive and deductive reasoning skills.

Demonstrate critical and self-critical thinking, considering professional ethics, moral values and social implications of the different activities carried out throughout the degree.

Demonstrate the ability to analyse, synthesise and reason critically.

Distinguish between the qualitative and quantitative aspects of chemical problems.

Distinguish the principles, procedures and techniques used in the determination, separation, identification and characterisation of chemical compounds.

Evaluate the risks involved in the use of chemical substances and laboratory procedures.

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

Identify chemical elements and their compounds, including their extraction, structure, reactivity, properties and applications.

Identify chemical processes in everyday life.

Identify the main types of chemical reactions and their associated key characteristics.

Identify the unit operations of chemical engineering.

Implement sustainable and environmentally friendly methodologies.

Interpret the relationship between the variation in the characteristic properties of chemical elements and the Periodic Table.

Prepare reports, assessments, and industrial and environmental projects in the field of chemistry.

Propose creative and innovative solutions to complex situations or problems in the field, addressing diverse professional and social needs.

Relate chemistry to other disciplines.

Relate theory to experimentation.

Solve problems effectively.

Understand and analyse, from the perspective of the degree programme, social inequalities based on sex and gender; integrate gender-sensitive approaches 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.

Analysis of environmental samples. Bioanalysis. Environmental chemical analysis. Analytical applications

2. ENVIRONMENTAL CHEMICAL ANALYSIS

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.