

**COURSE DATA****DATA SUBJECT**

Code: 36900
Name: Bioprocesses in the Chemical Industry-Dual Mention
Cycle: Undergraduate Studies
ECTS Credits: 6
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	Bioprosesos en la Industria Química	ELECTIVES

COORDINATION

MONLEON VENTURA ALICIA

SUMMARY

The subject "Bioprocesses in the Chemical Industry" is an optional subject of Dual Mention, of 6 ECTS, which is taught in the fourth year.

The main objective of the subject is to provide the student with basic knowledge about biochemical processes of industrial relevance.

In relation to the Sustainable Development Goals (SDGs), in this subject, students are expected to be able to apply the knowledge learned to design, select and/or develop efficient chemical products and processes (SDG 7) that minimize their impact on the environment (SDG 14 and 15), take advantage of 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

R4-OBLIGATION TO HAVE PREVIOUSLY PASSED THE SUBJECT34191 Biology

In order to be able to take the course, students must have been selected to enrol in the Bachelor's 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.

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.

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.

Describe the characteristics and behaviour of the different states of matter and the theories used to explain them.

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 structure and reactivity of the main classes of biomolecules and the chemistry of key biological processes.

Implement sustainable and environmentally friendly methodologies.



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.

State the principles of thermodynamics and kinetics and their application in chemistry.

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.

Use chemical terminology, nomenclature, conventions and units correctly.

DESCRIPTION OF CONTENTS

The subject Bioprocesses in the Chemical Industry is based on the realization of an autonomous and individual work that each student must carry out under the supervision of a tutor of the Company, supervised by the academic tutor, and according to the training plan agreed between the tutors and the student.

In particular, the following aspects will be dealt with:

Structure and function of macromolecules and supramolecular complexes. Enzymology and control of biochemical reactions. Bioenergetics. Metabolism. Genetic information flow. Molecular biotechnology. Methodology in Biochemistry.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Internship	60,00
Total hours	60,00

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 Committee. 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 tutorials with the academic tutor, independent work by the student, seminars and activities related to the acquisition of transversal competences could be carried out both in the company and in the Faculty of Chemistry.

EVALUATION

The evaluation will be carried out by means of a continuous evaluation system in which both the company tutor and the academic tutor will be involved. The system is based on the evaluation of competencies, skills and knowledge acquired by the students.

The activity developed can be evaluated by means of:

- Surveys and follow-up reports that allow to know the acquisition of knowledge, skills and



competences of the students.

- A rubric agreed between the company tutor and the academic tutor to be specified in the training plan.
- Follow-up meetings and interviews carried out between the tutors and the student in which the degree of compliance with the training plan and the competencies acquired will be verified.
- A written or oral exam if required by the activities carried out in the company.

In order to pass the subject, the competences acquired will be evaluated using as indicators the reports of the company and/or University tutors, with a weight of 30% of the final grade.

In addition, the evaluation meetings, tests and reports of the work done during the dual training will be evaluated, with a weight of 70% of the final grade.

REFERENCES

- PERETÓ, J., SENDRA, R., PAMBLANCO, M. y BAÑÓ, C. Fonaments de bioquímica. 5ª ed. Valencia: Servei de Publicacions de la Universitat de València, 2005 (traducción al castellano, 2007). ISBN: 9788437062686.
- TYMOCZKO, J.L., BERG, J.M., STRYER, L. Bioquímica. Curso Básico. Traducción de la 2ª ed. Barcelona: Editorial Reverté, 2014. ISBN-10: 8429176039
- NELSON, D.L. y COX, M.M. Lehninger. Principios de Bioquímica. 6ª ed. Barcelona: Ed. Omega, 2014. ISBN: 978-84-282-1603-6.
- MCKEE, T. y MCKEE, J.R. Bioquímica. Las Bases Moleculares de la Vida. Mexico: MacGraw Hill Interamericana Editores, 4ª ed., 2009. ISBN: 9788448605247.