

## 30102 - Chemistry

### Syllabus Information

**Academic year:** 2023/24

**Subject:** 30102 - Chemistry

**Faculty / School:** 175 - Escuela Universitaria Politécnica de La Almunia  
179 - Centro Universitario de la Defensa - Zaragoza

**Degree:** 425 - Bachelor's Degree in Industrial Organisational Engineering  
563 - Bachelor's Degree in Industrial Organisational Engineering

**ECTS:** 6.0

**Year:** 1

**Semester:** 425 - First semester  
563 - Second semester

**Subject type:** Basic Education

**Module:**

### 1. General information

The objective of the subject is that students acquire a basic vision of the structure of matter in relation to its properties and to the chemical transformations it can undergo.

These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>), in such a way that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to their achievement.

#### **COMPANY PROFILE**

Goal 6: Clean Water and Sanitation.

#### **DEFENSE PROFILE**

Goal 6. Clean water

Goal 7. Affordable and non-polluting energy

Goal 13. Climate Action

### 2. Learning results

1. Master the basic principles of general chemistry, organic chemistry and inorganic chemistry inorganic chemistry.

2. Master the basic laws that regulate reactions: thermodynamics, kinetics and equilibrium equilibrium.

3. Solve exercises and problems in a complete and reasoned way.

4. Properly apply theoretical concepts in the laboratory through the correctly and safely use of basic material and equipment.

5. Use rigorous language in chemistry.

6. Present and interpret data and results

### 3. Syllabus

#### **COMPANY PROFILE**

**BLOCK 1.** Atom and Periodic System.

*Unit 1.* The atom. *Unit 2.* General study of the Periodic Table.

**BLOCK 2.** Chemical bonding.

*Unit 3.-* Ionic bonding. *Unit 4.-* Covalent bonding. *Unit 5.-* Metallic bonding.

**BLOCK 3.** Bonds among molecules.

*Unit 6.-* Intermolecular bonds.

**BLOCK 4.** Aggregation states.

*Unit 7.-* Gaseous state. *Unit 8.-* Liquid state. *Unit 9.-* Solid state.

**BLOCK 5.** Introduction to the study of solutions.

*Unit 10.* Introduction to the study of solutions.

**BLOCK 6.** Introduction to the study of reactions.

*Unit 11.* Chemical equilibrium. *Unit 12.* Neutralization reactions.

**BLOCK 7.** Introduction to the analysis and organic chemistry.

Unit 13. Introduction to the chemical analysis of materials. Unit 14. Introduction to the study of Organic Chemistry.

**PRACTICE.** Knowing and handling laboratory material. Preparation of solutions. Filtration. Volumetric analysis. Distillation.

## **DEFENSE PROFILE**

**BLOCK I.** Chemical processes.

Unit 1. Chemistry and matter

Unit 2. Chemical reactions and stoichiometry

Unit 3. Chemical equilibrium

Unit 4. Energy and Chemistry

Unit 5. Chemical Kinetics

**BLOCK II.** Structure and properties of matter.

Unit 6. Atomic structure

Unit 7. Chemical Bonding I

Unit 8. Chemical Bonding II

Unit 9. Intermolecular forces

Unit 10. Solid state

Unit 11. Materials

## **4. Academic activities**

### **COMPANY PROFILE**

Lectures: sessions with the teacher in which the subject syllabus will be explained. 24 hours

Problems: sessions to solve problems posed by the teacher. 20 hours

Seminars: sessions of exposition of topics without repercussion in terms of evaluation. 4 hours

Laboratory practices. 6 hours

Assessment tests. 6 hours

### **DEFENSE PROFILE**

**Lectures [34 h]:** explanation of the contents of the subject.

**Resolution of problems and questions [17 h]:** resolution of theoretical and practical problems and questions.

**Laboratory practice [1h]**

**Evaluation tests [8 h]:** theoretical and practical exams of the subject.

## **5. Assessment system**

### **COMPANY PROFILE**

CONTINUOUS ASSESSMENT system:

Two eliminatory midterm exams of the subject, compensable between them, with a grade equal to or higher than 3. The grade is obtained as an average of both if both have been passed or have been compensated with the previous requirement.

GLOBAL FINAL ASSESSMENT system:

This test must be taken by those students who have not chosen the split assessment system or those who, having chosen this system, have not passed it. The latter should only be examined in this final test of the partial tests they have pending, which they must pass in order to pass the subject.

In any case, the tests will be 50% theory and 50% problems. In addition, in order to pass the subject by any of the systems, the laboratory practices must be completed.

### **DEFENSE PROFILE**

#### **Continuous assessment**

Test 1 (P1). Problem solving of topics 1, 2 and 3 (30% of the final grade). Minimum grade to pass the subject 4.0 out of 10.

Test 2 (P2). Theoretical-practical test of the entire syllabus (70% of the final grade). Minimum grade to pass the subject 4.0 out of 10.

The course is passed with a final grade equal to or higher than 5.0 out of 10.

#### **1st Call**

Students who have not passed the continuous assessment or who want to improve their performance may apply your grade, with the best of your grades prevailing. The overall test will consist of Test 1 (P1) and Test 2 (P2).

Test 1. Problem solving of topics 1, 2 and 3 (30% of the final grade). Minimum grade to pass the subject 4.0 out of 10.

Test 2. Theoretical-practical test of the entire syllabus (70% of the final grade). Minimum grade to pass the subject 4.0 out of 10. The subject is passed with a final grade equal to or higher than 5.0 out of 10.

**2nd call**

It will consist of Test 1 (P1) and Test 2 (P2), all students will be required to take both tests.

Test 1. Problem solving of topics 1, 2 and 3 (30% of the final grade). Minimum grade to pass the subject 4.0 out of 10.

Test 2. Theoretical-practical test of the entire syllabus (70% of the final grade). Minimum grade to pass the subject 4.0 out of 10. The subject is passed with a final grade equal to or higher than 5.0 out of 10.

If the grade of Test 1 (P1) and/or the grade of Test 2 (P2) are lower than 4, the student does not pass the subject and the final grade is calculated as follows:

If  $P1 < 4$  and  $P2 < 5$ ; Final grade =  $0.30 \cdot P1 + 0.70 \cdot P2$

If  $P1 < 4$  and  $P2 > 5$ ; Final grade =  $0.30 \cdot P1 + 3.5$

If  $P1 < 5$  and  $P2 < 4$ ; Final grade =  $0.30 \cdot P1 + 0.70 \cdot P2$

If  $P1 > 5$  and  $P2 < 4$ ; Final grade =  $1.5 + 0.70 \cdot P2$

Assessment instruments:	Weighting	RA-1	RA-2	RA-3	RA-4	RA-5	RA-6
Test 1	30 %			x		x	x
Test 2	70 %	x	x	x	x	x	x