1. BASIC INFORMATION

Course	Chemistry for engineering
Degree program	Bachelor's Degree in Industrial Systems Engineering
School	School of Architecture, Engineering, Science and Computing
Year	1
ECTS	6
Credit type	Basic
Language(s)	English
Delivery mode	Face to face
Semester	S2
Academic year	25-26
Coordinating professor	Janaina Cejudo

2. PRESENTATION

Chemistry is a subject taught in the first year of several engineering degrees. Its aim is to introduce the basic concepts of chemistry that an engineer will need in his or her professional career. Concepts developed in this course will be applied in other subjects in the following courses. The course is divided into two sections. The first one studies the structure and properties of matter. The second explains chemical transformations and their relation to various industrial processes involved in the engineering world.

Engineers must acquire sufficient chemical knowledge to understand the basic characteristics of the materials used in their profession. They should be able to recognize the requirements and characteristics of different compounds and process in different environments.

3. LEARNING OUTCOMES

Knowledge

KNO3: Ability to understand and apply the principles of basic knowledge of general chemistry, organic and inorganic chemistry and their applications in engineering.

- Describe the chemical structure of matter and molecular interactions, the aggregation state of matter, and its properties
- Explain the chemical nature of organic compounds
- Explain the chemical nature of inorganic compounds
- Explain applied problems in the field of engineering that involve chemical transformations of matter

Skills

SK18: Ability to carry out laboratory experiments in the field of physics, chemistry and materials in the industrial area

- Conduct experiments in the chemical laboratory
- Prepare scientific reports

Competences

CP14: Integrate analysis with critical thinking in a process of evaluating different ideas or professional possibilities and their potential for error, based on evidence and objective data that lead to effective and valid decision-making.

4. CONTENT

- Chemical structure of matter: atomic structure. Periodic system, chemical bonding.
- Intermolecular forces. States of matter.
- Chemical reactions. Dissolutions, Performance
- Thermochemistry and chemical kinetics
- Acid-base and redox balances
- Organic and inorganic chemistry in engineering

5. TEACHING-LEARNING METHODOLOGIES

The types of teaching-learning methodologies used are indicated below:

- Master class
- Problem based learning
- Workshop-based learning
- Simulation environments

6. LEARNING ACTIVITIES

Listed below are the types of learning activities and the number of hours the student will spend on each one:

Campus-based mode:

Learning activity	Number of hours
Master classes	10
Practical seminars	20
Problem solving	34
Written reports and essays	6
Workshop and/or laboratories activities	10
Autonomous study	60
Debates and panel discussions	5
Face-to-face assessment test	5
TOTAL	**150**

7. ASSESSMENT

Listed below are the assessment systems used and the weight each one carries towards the final course grade:

Campus-based mode:

Assessment system	Weight min. %	Weight max.%
Face-to-face assessment test	50	60
Written reports and essays	0	10
Case/problem	15	40
Performance evaluation	5	5
Laboratory/workshop notebook	5	10

When you access the course on the *Campus Virtual*, you'll find a description of the assessment activities you have to complete, as well as the delivery deadline and assessment procedure for each one.

8. SCHEDULE

This table shows the delivery deadline for each assessable activity in the course:

Campus-based mode:

Assessable activities	Deadline
Working Session 1	Week 5
Midterm Exam	Week 8
Working Session 2	Week 11
Working Session 3	Week 14
Group Project - Report	Week 15
Group Project – Defense	Week 16
Final Exam	Week 18

This schedule may be subject to changes for logistical reasons relating to the activities. The student will be notified of any change as and when appropriate.

9. BIBLIOGRAPHY

The main reference work for this subject is:

- "Chemistry", K.A. Goldsby R. Chang, 12ª ed., Madrid, McGraw-Hill, 2016.

The recommended Bibliography is:

- "Fundamentals of engineering thermodynamics". Michael J. Moran, Howard N. Shapiro; John Wiley & Sons. 2014.
- "Chemistry & Chemical Reactivity". 8th ed. John c. Kotz.
- "General Chemistry " Ralph H. Petrucci, William S. Harwood; Prentice Hall, D.L. 1998.
- "Organic chemistry" / K. Peter C. Vollhardt, Neil E. Schore. 5th ed New York: W.H. Freeman andCompany, 2007.

10. EDUCATIONAL GUIDANCE, DIVERSITY AND INCLUSION UNIT

From the Educational Guidance, Diversity and Inclusion Unit we offer support to our students throughout their university life to help them reach their academic achievements. Other main actions are the students inclusions with specific educational needs, universal accessibility on the different campuses of the university and equal opportunities.

From this unit we offer to our students:

1. Accompaniment and follow-up by means of counselling and personalized plans for students who need to improve their academic performance.
2. In terms of attention to diversity, non-significant curricular adjustments are made in terms of methodology and assessment for those students with specific educational needs, pursuing an equal opportunities for all students.
3. We offer students different extracurricular resources to develop different competences that will encourage their personal and professional development.
4. Vocational guidance through the provision of tools and counselling to students with vocational doubts or who believe they have made a mistake in their choice of degree.

Students in need of educational support can write to us at:

orientacioneducativa@universidadeuropea.es

11. ONLINE SURVEYS

Your opinion matters!

The Universidad Europea encourages you to participate in several surveys which help identify the strengths and areas we need to improve regarding professors, degree programs and the teaching-learning process.

The surveys will be made available in the “surveys” section in virtual campus or via e-mail.

Your assessment is necessary for us to improve.

Thank you very much for your participation.