1. BASIC INFORMATION

Course	Material science
Degree program	Bachelor's Degree in Industrial Systems Engineering
School	School of Architecture, Engineering, Science and Computing
Year	1
ECTS	6
Credit type	Mandatory
Language(s)	English
Delivery mode	Face to face
Semester	S2
Academic year	25-26
Coordinating professor	José Luis Aguilar García

2. PRESENTATION

This subject belongs to the Materials Engineering group, and it is the only one in the group. In this subject, the student is introduced to the materials used in engineering, their structure and basic properties. With the knowledge acquired in this subject, the student is able to predict the behavior of materials in service, as well as to choose the most appropriate one for different benefits and requests.

3. LEARNING OUTCOMES

Knowledge

KNO7: Knowledge of the fundamentals of materials science, technology and chemistry. Understand the relationship between microstructure, synthesis or processing, and material properties

- Recognize the structure of different types of materials
- Identify the most appropriate type of material for a given application
- Relate the structure of different types of materials to their properties
- Predict the in-service behavior of a material when it is working in a certain application

Skills

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

- Characterizing the properties of a material through laboratory tests

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

- The solid: the bond in solids. Structure of solids. Crystalline defects
- Material properties
- Phase balance diagrams
- Metallic, polymer and ceramic materials
- Other materials
- In-service performance of materials

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	10	20
Case/problem	20	30
Performance evaluation	5	5

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
Presentation by the teacher of the theoretical contents of the subject.	Week 1-17
Search for information and delivery of working plan for the integrative project.	Week 4-8
Laboratory practices.	Week 7-12
Taking an intermediate knowledge test.	Week 7-10
Resolution of exercises, problems, tests and practical work in the classroom.	Week 1-17
Completion of the integrative project. Presentation of integrative project. Exam and final evaluation.	Week 17-18

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:

- M.F. ASHBY and col., Materiales para ingeniería, Vol. 1 y 2, Reverté, 2009.

The recommended Bibliography is:

- W.D. CALLISTER, Jr., Ciencia e Ingeniería de los Materiales, Vol. 1 y 2, Reverté, 2016.
- J.F. SHACKELFORD, Introducción a la Ciencia de Materiales para Ingenieros, McGraw Hill, 2014.
- W.F. SMITH, Ciencia e Ingeniería de Materiales, McGraw Hill, 2014.

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.