

29810 - Materials Engineering

Syllabus Information

Academic year: 2024/25

Subject: 29810 - Materials Engineering

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

326 - Escuela Universitaria Politécnica de Teruel

Degree: 440 - Bachelor's Degree in Electronic and Automatic Engineering

444 - Bachelor's Degree in Electronic and Automatic Engineering

ECTS: 6.0

Year: 2

Semester: First semester

Subject type: Compulsory

Module:

1. General information

The aim is to train students in the basic principles of chemistry and physics of materials, to learn about their properties and applications. Those materials that due to their characteristics are of special relevance in the elements, components and devices used in electronic and automation technology will be considered.

It will also be pursued that the student acquires the ability to reason and relate concepts between properties of materials in the context of their applications.

2. Learning results

- To know the fundamentals of science, technology and chemistry of materials commonly used in Industrial Engineering in general and in Electronics and Automation Engineering in particular.
- To understand the relationships between microstructure and macroscopic properties of materials.
- To know how to apply knowledge of science, technology and chemistry to the choice and behaviour of metallic, ceramic, polymeric and composite materials.
- To know the electrical, magnetic and optical materials, as well as their tests and specifications.
- To know how to perform material tests.

3. Syllabus

- Atomic organization in solids: Crystalline structure.
- Defects and diffusion: Microstructure.
- Mechanical properties.
- Phase diagrams and transformations.
- Thermal properties.
- Electrical properties.
- Magnetic properties.
- Optical properties.
- Metallic materials.
- Ceramics.
- Polymers.
- Composite materials.

4. Academic activities

Río Ebro Campus (Zaragoza).

- Lectures (30 horas). Presentation and clarification in the classroom of the fundamental concepts and knowledge of the syllabus.
- Exercise classes (15 hours). Resolution of exercises, especially those that show the most common procedures.
- Laboratory practical sessions (15 hours). Sessions to work on concepts and experimental procedures in the characterization of material properties.
- Personal study and work (85 hours).
- Evaluation (5 hours).

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- Lectures (30 horas). Presentation and clarification in the classroom of the fundamental concepts and knowledge of the syllabus.
- Exercise classes (20 hours). Resolution of exercises, especially those that show the most common procedures.
- Laboratory practical sessions: (10 hours). Sessions to work on concepts and experimental procedures in the characterization of material properties.
- Personal study and work (87 hours).
- Evaluation (3 hours).

At EUPT, the degree is offered in two different modalities: on-site and blended learning. All the above mentioned applies in the classroom. In the blended learning course, the necessary work material (Moodle platform) will be available to follow the subject in an autonomous way. The resolution of problems and cases, as well as the explanation of the content of the practices of laboratory, will be supported by teaching videos and virtual tutorials.

5. Assessment system

Río Ebro Campus (Zaragoza).

Laboratory practicals (30% of the final grade). There are two ways to pass this part:

1. Optional laboratory practicals exam (only students who attend all sessions): 2 short written partial tests after the 3rd and 5th lab session. Minimum grade of 4/10 in both tests for averaging.
2. Final exam of laboratory practicals: When no attendance to all sessions or optional exam failed or not taken: compulsory written test together with the final exam of longer duration than the partial tests is carried out on the date established for official announcements. Minimum grade of 4/10.

Final Exam (70% of the final grade): Two mandatory parts of equal value: Questionnaire (35%) and resolution of exercises (35%). It is carried out on the date established for the official calls. Minimum grade of 3/10 in each of these parts and minimum average of 4/10 to pass this exam.

To pass the course a minimum grade of 4/10 must be obtained in each of the tests described and a minimum average of 5/10 in the final grade.

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- Laboratory practicals (30% of the final grade): Evaluation will be carried out from deliverables. Without attendance to all sessions and/or grade lower than 4 in practical work: compulsory written test together with the final exam (minimum grade of 4/10 for averaging).

In the blended mode of the EUPT, the part of laboratory practices will be evaluated through the completion of teaching tasks related to the content of the practicals. Minimum grade of 4/10. A lower grade will mean the performance of a written test along with the final exam.

- Final Exam (70% of the final grade): Two mandatory parts of equal value: Questionnaire (35%) and resolution of exercises (35%). Minimum grade of 3/10 in each of the parts and minimum average of 4/10 to pass this exam.

To pass the subject a minimum grade of 4/10 must be obtained in each of the parts described above and a minimum average of 5/10 in the final grade.

6. Sustainable Development Goals

- 7 - Affordable and Clean Energy
- 9 - Industry, Innovation and Infrastructure
- 12 - Responsible Production and Consumption