29712 - Fundamentals of Engineering Materials

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	434 - Bachelor's Degree in Mechanical Engineering 330 - Complementos de formación Máster/Doctorado
ECTS	6.0
Course	XX
Period	Indeterminate
Subject Type	ENG/Complementos de Formación, Compulsory
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

5.2.Learning activities

5.3.Program

The contents have been structured in 3 blocks, each divided in several modules:

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A. Study and understanding of basic concepts related to the microstructure of a material

A1. Crystalline structures

A2. Crystal defects and diffusion

A3. Equilibrium phase diagrams

A4. Phase transformations

B. Correlation between properties and microstructure of a material

B1. Mechanical properties and deformation mechanisms

B2. Fracture mechanisms

B3. Thermal treatments of steels

B4. Physical properties of materials

C. Study of the main groups of materials

C1. Metals and alloys

C2. Ceramics

C3. Polymers

C4. Composite materials

Practical sessions

P1. Tensile testing. Charpy impact test.

P2. Brinell and Vickers hardness tests. Cold rolling of copper and recrystallization annealing.

P3. Rockwell B and C hardness tests. Thermal treatments of steels. Metallography of Fe-C alloys.

P4. Precipitation in aluminium alloys. Jominy test

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5.4.Planning and scheduling

5.5.Bibliography and recomended resources