

66424 - Deformation and Fracture of Engineering Materials

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	536 - Master's in Mechanical Engineering
ECTS	6.0
Course	1
Period	First semester
Subject Type	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

In order to allow the students to reach the learning objectives and to reach the skills associated with this course, we propose the following activities:

A01: Lectures (30h): Lectures describing the main contents of the course.

A02: Problems and cases (15h).

66424 - Deformation and Fracture of Engineering Materials

A03: Laboratory sessions and visits to research laboratories (15h)

A04: Practical work (20 h of personal work): Several subjects related with mechanical properties of materials and their characterization will be proposed to the students.

A05: Tutorial (5h): Moments to discuss with students the questions they have related with the different items that have been discussed in the different activities of the course.

A06: Study of the course contents (59 h)

A07: Evaluation activities (6 h): Evaluation activities that cover an exam, the laboratory informs and the presentation of the practical work.

5.2.Learning activities

The program include the following activities ...

1. To study the mechanical properties of the different materials and of the constitutive equations that explain their behaviour.
2. To do mechanical essays on different types of materials and visit to different laboratories where these essays are performed.
3. To simulate different mechanical behaviours using FEM software.
4. To apply fracture mechanics to different materials.

5.3.Program

- Part 1. Deformation of materials for engineering
 - Behaviour of materials for mechanical design.
 - Mechanical experiments and norms.
 - Elastic behaviour.
 - Permanent deformation.
- Part 2: Fracture of materials for engineering
 - Fracture and Fatigue.

66424 - Deformation and Fracture of Engineering Materials

- Fracture experiments.
 - Part 3: Computing techniques.
- Computing programs of materials mechanical behaviours.

5.4.Planning and scheduling

The course planning, that includes all in-person activities and laboratory sessions, is defined by the academic calendar.

Each professor will announce the periods when students can reach him to solve questions related with the course.

5.5.Bibliography and recomended resources

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| BB | Hertzberg, Richard W.. Deformation and fracture mechanics of engineering materials / Richard W. Hertzberg . - 4th ed. New York [etc.] : John Wiley & Sons, cop. 1996 |
| BB | Hosford, William F.. Mechanical behavior of materials / William F. Hosford . - 1st pub. Cambridge [etc.] : Cambridge University Press, 2005 |
| BB | Oden, J. T. q(J. Tinsley). Finite elements of nonlinear continua / J.T. Oden New York ; [Maidenhead] : McGraw-Hill, 1972 |