# Materials science and engineering

**Academic Year: ( 2019 / 2020 )** **Review date: 12-12-2019**

**Department assigned to the subject: Department of Materials Science and Engineering and Chemical Engineering**

**Coordinating teacher: ALVAREDO OLMOS, PAULA**

**Type: Compulsory ECTS Credits : 6.0**

**Year : 2 Semester : 2**

## COMPETENCES AND SKILLS THAT WILL BE ACQUIRED AND LEARNING RESULTS.

1. knowledge and understanding of key aspects of materials science, technology and chemistry.
2. the ability to apply their knowledge and understanding to identify, formulate and solve problems of materials science, technology and chemistry using established methods;
3. the ability to design and conduct appropriate experiments of materials science, technology and chemistry, interpret the data and draw conclusions;
4. workshop and laboratory skills in materials science, technology and chemistry.
5. the ability to select and use appropriate equipment, tools and methods to solve problems of materials science, technology and chemistry;
6. the ability to combine theory and practice to solve problems of materials science, technology and chemistry;
7. an understanding of applicable techniques and methods in materials science, technology and chemistry, and of their limitations.

## DESCRIPTION OF CONTENTS: PROGRAMME

Study of materials: metallic, ceramic, polymers and composites.
Manufacturing and treating techniques of materials.
Structure of materials.
Mechanical testing of materials.
Conductor, semiconductor, isolating and magnetic materials: application in electric technology.
Materials performance.
Selection criteria.

## LEARNING ACTIVITIES AND METHODOLOGY

Masterly classes, classes to solve doubts in reduced groups, student presentations, individual tutorship and personal work of the student; oriented to acquire theoretical knowledge (3 ECTS credits).
Laboratory classes, classes for solving problems in reduced groups; individual tutorship and personal work of the student; oriented to acquire practical knowledge related to subject program (3 ECTS credits).

## ASSESSMENT SYSTEM

The assistance to the laboratory sessions is MANDATORY. The entrance to the laboratory is enabled once the student has watched the general security video and the specific video for materials lab and answered both tests correctly. THE STUDENT CAN NOT ENTER THE LABORATORY IF HE/SHE HAS NOT ANSWERED THE TESTS. THE NON-ASSISTANCE TO THE LABORATORY WITHOUT JUSTIFIED CAUSE IMPLIES SUSPENDING THE CONTINUOUS EVALUATION.

40% of the continuous assessment will be given by:

30%: Three mid-term exams, each with an calification of 10%, which will be done during class time.
10%: Lab work done outside of class time. The final note of the laboratory will be given by the behavior in the laboratory, realization of lab work and realization of a questionnaire at the end of each session.
60% of the continous assessment will be given by the score of the final exam.
For continuous evaluation a minimum score of 4 is required on the final exam.

Normative continuous assessment:
https://www.uc3m.es/ss/Satellite/UC3MInstitucional/en/ListadoNormativas/1371206706530/Estudios_de_Grado

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|---|---|
| **% end-of-term-examination:** | 60 |
| **% of continuous assessment (assigments, laboratory, practicals…):** | 40 |

BASIC BIBLIOGRAPHY


- ASHBY MF, JONES DRH. Materiales para Ingeniería 1. Introducción a las propiedades, las aplicaciones y el diseño¿., Reverté. 2008.
- ASKELAND DR. "Ciencia e Ingeniería de los Materiales",, International Thomson, 4ª Edición, Madrid, 2001.
- CALLISTER WD. "Ciencia e Ingeniería de los Materiales". Vol. I,, Ed Reverté, 3ª Edición, Barcelona, 1995.
- MANGONON PL. ¿Ciencia de Materiales. Selección y Diseño¿., Prentice Hall, 1ª Edición, Méjico, 2001.
- SHACKELFORD JF. "Introducción a la Ciencia de Materiales para ingenieros",, Prentice Hall, 4ª Edición, Madrid, 1998.
- SMITH WF. "Fundamentos de la Ciencia e Ingeniería de Materiales",, McGraw-Hill, 3ª Edición, Madrid, 2003.