

Academic Year: ( 2019 / 2020 )

Review date: 15-01-2019

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

Coordinating teacher:

Type: Master Final Project ECTS Credits : 12.0

Year : 1 Semester : 2

## OBJECTIVES

### BASIC COMPETENCES

- Acquiring and understand concepts that provide the foundation or opportunity to be original on the development and/or application of ideas, often in a research context.
- Students will be able to apply the acquired knowledge and skills on problem resolution in new or hardly known environments in the context of wide (or multidisciplinary) contexts related to the area under study
- Students will be able to integrate knowledge to face the complexity of making assessments based on limited or incomplete information, but considering the ethical and social responsibilities associated to the application of their knowledge and assessments.
- Students will be able to communicate their conclusions and the knowledge and reasons that support them to specialized and the wide public in a clear and unambiguous manner
- Students will acquire learning skills that allow them to continue studying in an autonomous and self-paced way.

### GENERAL COMPETENCES

- Understand the challenges associated to Materials Science and Engineering in an industrial and research environment
- Know the disciplines appropriated for working in a laboratory of materials and for optimizing the obtaining of results
- Develop team working skills in a research environment
- Develop skills to apply the acquired knowledge to the research and development of new materials or in technologies for their processing in strategic sectors.
- Combine the interest on innovation and process optimization, with the need of doing so in an environmentally friendly manner.
- Acquire the required skills to defend a research project and its results.

### SPECIFIC COMPETENCES

- Be able to develop creative strategies and decision-making facing problems related to materials, manufacturing and behavior.
- Know the techniques of characterization of materials and personally experiencing its handling in the laboratory
- Consolidate specific research skills in Materials Science and Engineering
- Acquire knowledge and useful scientific and technical skills to solve specific problems associated with the work in a research laboratory in the field of material development and characterization

## LEARNING RESULTS

The learning results that the passing of this subject implies are:

- Consolidating abilities that allow working in a laboratory of materials in a self-sufficient way
- Using with ease advanced research techniques, being able to contribute to the improvement of the process of obtaining new knowledge.
- Ability for processing computing, summarizing and/or analyzing in depth research results and plotting them in a proper way.
- Analyzing critically the existing scientific bibliography and using it to corroborate and discuss the results obtained.

- Making a complete scientific document, considering usual points in the field.

## DESCRIPTION OF CONTENTS: PROGRAMME

In this subject, the student will develop a research work proposed by his supervisor, who will be a doctor with relevant research experience in the area Material Science and Engineering.

During the research project, the student will have to obtain new results, working in the laboratory, about formulation, processing o characterization of materials. With this aim, the student will individually receive the specific formation needed for carrying out this work, by tutorials and lessons in the laboratory. The student will learnt to solve problems implied in non-routine experimental work, being always under the guidance of his/her supervisor.

The student will have to write a memory where his/work will be summarized and discussed. Eventually, the student will carry out a oral, public defense, where the most relevant aspect of the research and main conclusions will be explained. The questions of tribunal of experts about the subject will also have to be answered. The defense of the work will take place at a fixed date, announced in advance.

## LEARNING ACTIVITIES AND METHODOLOGY

### LEARNING ACTIVITIES:

- Tutorials
- Individual work from the student

### TEACHING METHODOLOGIES

- Critical reading by the student of science text and papers recommended by the supervisor.
- Obtaining experimental results in the lab, using research equipments and techniques, under professor supervision
- Elaborating works and reports, alone or in groups.

### TUTOR:

En el caso de que el director del "Trabajo de fin de máster" no fuera profesor de un de los departamentos de la Universidad Carlos III de Madrid implicados en la docencia del Máster, un profesor que cumpla esa condición actuará como tutor para orientar al alumno.

### NORMATIVE:

[http://www.uc3m.es/ss/Satellite?blobcol=urldata&blobheader=application%2Fpdf&blobheadername1=Content-Disposition&blobheadername2=Cache-Control&blobheadervalue1=attachment%3B+filename%3D%22Informaci%C3%B3n\\_sobre\\_el\\_TFM.pdf%22&blobheadervalue2=private&blobkey=id&blobtable=MungoBlobs&blobwhere=1371554321860&ssbinary=true](http://www.uc3m.es/ss/Satellite?blobcol=urldata&blobheader=application%2Fpdf&blobheadername1=Content-Disposition&blobheadername2=Cache-Control&blobheadervalue1=attachment%3B+filename%3D%22Informaci%C3%B3n_sobre_el_TFM.pdf%22&blobheadervalue2=private&blobkey=id&blobtable=MungoBlobs&blobwhere=1371554321860&ssbinary=true)

## ASSESSMENT SYSTEM

- Involvement in the laboratory work and demonstrated critical analysis on considered matter.
- Carry-out and exhibition of a individually-made report.

The evaluation will be carried out by three doctors from the doctors belonging to the Universidad Carlos III de Madrid who are involved in the Master teaching. The opinion of the student's supervisor would be born in mind. Moreover, with the aim of ease the evaluation of the students by the tutor and the examination board, the templates published in the web will be used.

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