



## **Máster en Erasmus Mundus en Ingeniería de Membranas 69143 - Master thesis**

**Guía docente para el curso 2014 - 2015**

**Curso: 2, Semestre: 2, Créditos: 30.0**

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### **Información básica**

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#### **Profesores**

No están disponibles estos datos.

#### **Recomendaciones para cursar esta asignatura**

##### Recommendations

The "Final Master Project" is compulsory and counts for 30 ECTS. The written report for the project and its defense in front of a tribunal composed of three teachers should be done in English. The topic of the Final Master project may be selected from a varied offer on topics, related to membrane science and technology of relevance to the current scientific and technological scene. The work is highly specialised, so the topic must be in line with the qualification and prior knowledge of the student. The choice of project for each student requires approval from the admission and evaluation committee, thus ensuring that the student's prior training allows the possibility of covering the topic successfully.

The defense of the Final Master's project can only take place once the student has passed all modules in the Master's.

#### **Actividades y fechas clave de la asignatura**

##### Main activities and key dates

The students may begin their Final Master Project (whether this means the bibliographical search and review or the laboratory work) at the beginning of the fourth semester of the Master. To enter into the laboratories a course about safety in the laboratory should be done.

All the students should present in the secretary of the Faculty of Science, an application form in a normalized model, about the Final Master Project Proposal that should contain:

-Title proposed

-Short description of the project, that includes the context, main challenges and objectives of the proposal.

-Name of the student

-Supervisor of the work. In case the supervisor is not a teacher from the Master at the University of Zaragoza, Faculty of Science, one teacher that fulfills this requisite should also signed the proposal as overseer.

For the presentation of this document an specific calendar concerning about deadlines for the Final Master Project will be posted in the web page of the Faculty of Science, <https://ciencias.unizar.es/>. In any case, this document should be presented before the end of March.

The deposit of the written document should be done at least 15 days before the oral defense.

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## Inicio

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### Resultados de aprendizaje que definen la asignatura

**El estudiante, para superar esta asignatura, deberá demostrar los siguientes resultados...**

**1:** Introduction and Learning outcomes

The students develop a Final Master project with all the necessary ingredients to create a quality written report that includes: a review of the state of the art, approach to the problem under study, design and execution of the experimental section, interpretation of the results obtained, conclusions and application of the results.

- To be able to develop an experimental project with significant levels of independence and originality.
- To know how to apply the theoretical knowledge to the interpretation and review of the experimental results
- Have skill at oral and written communication, circulating the results and interaction with colleagues and professionals from other disciplines.

## Introducción

### Breve presentación de la asignatura

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## Contexto y competencias

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### Sentido, contexto, relevancia y objetivos generales de la asignatura

**La asignatura y sus resultados previstos responden a los siguientes planteamientos y objetivos:**

Context and competences

The Final Master Project allows students to gain a very high level of specialisation in the the topic area chosen and, generally speaking, acquire fundamental abilities for them when they join the job market or do their doctoral theses or research contracts. This refers to their ability to self-teach; to face different and unknown problems, intelligently applying a method and protocols that allow for them to be solved; interaction with other researchers to increase their ability to work in a team; develop leadership skills; take decisions, increase their ability to communicate their ideas and results via the creation of projects, reports, articles, posters, etc.

### Contexto y sentido de la asignatura en la titulación

This project is the culmination of the practical application of the other subjects in the master to a real problem where the student - always under supervision of a tutor - faces daily work in a laboratory, living up close the experiences, difficulties, challenges of the work and where to apply a method or series of protocols allowing for the proposed objectives to be achieved. To achieve the above, the student will make use of the theoretical knowledge, attitudes, aptitudes and skills acquired over the Master.

**Al superar la asignatura, el estudiante será más competente para...**

**1:** When the student passes this subject, he/she should have the competences for

- ...assessing the true difficulties that come with the practical pursuit of an idea or concept.
- ...facing up unexpected problems with the right methodology.
- ...applying theoretical knowledge to the interpretation and review of experimental results.
- ...independent study and self-teaching required to undertake the research or professional activity in the near future.
- ...having skills at oral and written communication, circulating the results and interaction with colleagues and professionals from other disciplines.
- ...having general abilities for good professional practice.

## **Importancia de los resultados de aprendizaje que se obtienen en la asignatura:**

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## **Evaluación**

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### **Actividades de evaluación**

**El estudiante deberá demostrar que ha alcanzado los resultados de aprendizaje previstos mediante las siguientes actividades de evaluación**

**1:** Evaluation

The student will present a written report - between 30 and 50 pages, (Times New Roman 12, spacing 1.5), with the possibility of including limitless appendices with figures, tables, etc. - that brings together the project undertaken and this will be defended in public in front of three lecturers from the Master's. The defense will include not only the presentation of the starting hypothesis, development of the project and the conclusions, but also an intense debate with the tribunal on the validity and reach of the results obtained - in which all relevant scientific aspects of the project undertaken will be discussed. The oral presentation of the project will last a maximum of 20 minutes, followed by the debate lasting a maximum of 30 minutes. A score of between 1 and 10 will be given for the scientific quality of the work presented, methods used, results obtained and their interpretation, as well as the defense in front of the tribunal.

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### **Actividades y recursos**

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### **Presentación metodológica general**

**El proceso de aprendizaje que se ha diseñado para esta asignatura se basa en lo siguiente:**

Activities and resources

The project will be directed by doctors with ample experience in the tutoring of doctoral theses and projects. The students will have access to the laboratories and equipment at the Institute of Nanoscience as well as other tools and infrastructures available at UNIZAR. There will also be free access to the UZ library which has powerful databases, specialised books and subscriptions to numerous scientific magazines.

Highly personalized tutoring. Favouring an increase in the student's autonomous work: encourage students to give their own ideas and to participate in all stages of the project (planning, undertaking experiments, interpretation of results and circulation). Frequent open discussions with the tutor and other colleagues in the research group which the student has joined.

## **Actividades de aprendizaje programadas (Se incluye programa)**

**El programa que se ofrece al estudiante para ayudarle a lograr los resultados previstos comprende las siguientes actividades...**

### **Planificación y calendario**

#### **Calendario de sesiones presenciales y presentación de trabajos**

##### DEPOSIT OF FINAL MASTER PROJECT AT THE UNIVERSITY OF ZARAGOZA

-The work should included the approval of the supervisors for the deposit and presentation of Final Master Project, or if necessary the approval of the overseer.

To deposit the document the student should include:

1. -The approval of supervisor or overseer.
2. -A summary with no more than 300 words in Spanish
3. -The author should deposit his/her Final Master Project throught the repository for documents specifically established by the University of Zaragoza, ZAGUAN, through an application form via web, <http://zaguan.unizar.es/> making him/her responsible of the authorship, and guarantying that the deposited document fully corresponds to his/her Final Master Project that is going to defend. The student should present in the secretary of the Faculty of Science the confirmation of the electronic upload of the Final Master Project in "ZAGUAN" ( email of confirmation that the server sends automatically), before the public defense.

-The deposit of these documents should be done in the secretary of the Faculty of Science, at least 15 days before of the period established for the defense. The deposit should be done within the academic course that the student has been registered, if this does not occur the student should register again, paying the corresponding fee.

### **Referencias bibliográficas de la bibliografía recomendada**