60465 - Master's Dissertation

Información del Plan Docente

Academic Year	2016/17
Academic center	100 - Facultad de Ciencias
Degree	543 - Master's in Molecular Chemistry and Homogeneous Catalysis
ECTS	24.0
Course	1
Period	Annual
Subject Type	Master Final Project
Module	---

1.Basic info

1.1.Recommendations to take this course

Knowledge and compliance of the standard safety regulations applicable to a research laboratory are required.

Motivation, responsibility, curiosity, creativity and team-working skills will be appreciated.

1.2.Activities and key dates for the course

The *Master's Degree Final Project* (TFM) will be developed along the whole academic year. However, due to the major workload in the first semester it will be carried out intensively along the second one. The presentation and defense of Master Final Project will take place in the dates that will be opportunely announced well in advance at the websites of the Sciences Faculty, https://ciencias.unizar.es/calendario-y-horarios , and the Master, http://masterqmch.unizar.es .

2.Initiation

2.1.Learning outcomes that define the subject

To be able of developing a research project in Inorganic Chemistry, Organometallic Chemistry, Organic Chemistry or Catalysis, as an extension of the knowledge and competences acquired along the Master.

To apply the scientific methodology for developing an original research project including: bibliographic search; design, planning and development of experiments and data analysis and the drawing of conclusions.

To know, to analyze and to use critically the bibliography resources related to the research topic.

To apply the experimental and instrumental techniques in the area of Molecular Chemistry and Catalysis.

Aptitude to elaborate a descriptive report of the research results.

Ability to communicate and to debate with scientific rigor the research results.

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2.2.Introduction

The Master promotes the initiation into chemical research in the frontier of the scientific knowledge, in the areas of Molecular Chemistry and Catalysis, by means of undertaking the *Master's Degree Final Project* in research groups of recognized international prestige. The development of a research project, of whose experimental execution the student will be responsible directly, in a high-quality multidisciplinary research background provides an incomparable environment for the creation, development and transmission of scientific and technological knowledge. In addition, the utilization of advanced scientific instrumentation in the practical classes and Master's Final Project is an added value in order to find a qualified employment.

The *Master's Final Project* comprises the development of an original research project on a topic related to the Master's contents in one of the research groups of the ISQCH (Institute of Chemical Synthesis and Homogeneous Catalysis), the ICMA (Institute of Science of Materials of Aragon), and other public or private research centers related to the subject of the Master.

3.Context and competences

3.1.Goals

The *Master in Molecular Chemistry and Homogeneous Catalysis* aims to enable students the acquisition of knowledge and skills that allow their incorporation in different research fields both in public and private research centers, as well as in chemical companies.

The *Master's Degree Final Project* constitutes the culmination of the learning process of the Master. The aim of this module is to apply directly the acquired knowledge to the development of an original research project on a topic related to the Master's contents.

3.2.Context and meaning of the subject in the degree

The obligatory module *Master's Degree Final Project* (24 ECTS) encompasses the development of an original research project on a topic related to the Master's contents in one of the research groups of the ISQCH (Institute of Chemical Synthesis and Homogeneous Catalysis), the ICMA (Institute of Science of Materials of Aragon), and other public or private research centers related to the subject of the Master.

The elaboration and public defense of the *Master's Final Project* is of paramount importance in the Master program since it allows both the integration and the practical application of the knowledge acquired in the rest of subjects of the Master. In addition, this module allows for the development of general and transversal key competences of the Master.

3.3.Competences

To integrate and to evaluate research results in Molecular Chemistry and Catalysis, as well as to interpret them in a critical way and to relate them to theoretical knowledge.

To develop and to apply ideas, in a research context, so that original contributions in Molecular Chemistry and Catalysis transferable to the social environment could be realized.

To plan and execute experiments in an independent way, and to be self-critical in the evaluation both of the experimental procedures and research results.

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To apply protocols, procedures and advanced experimental techniques of synthesis and catalysis.

To select and to use in an autonomous way different instrumental and structural characterization techniques, including the utilization of advanced equipment, and the interpretation and validation of the obtained results.

To transmit the results and conclusions of a research project in oral, written or graphical form, using suitable presentation tools.

3.4.Importance of learning outcomes

The *Master's Degree Final Project* makes possible the integration of the competences and skills acquired along the course, and allows putting into practice the knowledge and capacities acquired by the students during the development of the educational program of the Master.

The contents and competences of the Master, materialized in the accomplishment of the *Master's Final Project* , guarantee the acquisition of the specialized formation required for a Doctorate Program. In addition, the Master provides a suitable formation for researchers and technical staff of I+D+i public and private institutions, and of chemical companies related to fine chemistry, materials and energy sectors.

4.Evaluation

In the evaluation of the *Master's Degree Final Project* the following aspects will be considered:

Written Memory of the work (60%).

Presentation and defense (30%).

Report of the supervisor (10%).

In the written Memory the scientific content of the work, as well as the capacity of analysis and synthesis demonstrated by the student during the accomplishment of the work and the editing of the Memory, will be evaluated. Along the presentation and defense of the work, the clarity of the presentation and the capacity of the student will be assessed. Additionally, the supervisor's report on the development of the work will be also considered.

In the elaboration and management of the Master's Degree Final Project, the Regulations from the University of Zaragoza , the Sciences Faculty Regulations and the Specific Regulations from the Comisión de Garantía de la Calidad of the Master, must be taken into consideration.

5.Activities and resources

5.1.General methodological presentation

The learning process for the *Master's Degree Final Project* has an applied character and allows developing a great number of competences from the knowledge acquired in the rest of subjects of the Master.

The research projects will be carried out in the research laboratories of the participant groups in the Master. The projects

will be supervised by permanent researchers from the University of Zaragoza and the Spanish Research Council (CSIC), or associate researchers, also holders of a Doctoral qualification, from both institutions. At the beginning of the academic course, the *Comisión de Garantía de la Calidad* will assignthe students the research projects, the supervisor and a tutor if required. The criteria of assignment will take into account, as far as possible, the preferences stated by the students.

The results of the research project will be presented in a written Memory. The work will be defended publicly in front of a Committee.

5.2.Learning activities

The *Master's Degree Final Project* (24 ECTS) take the form of a work of initiation into chemical research that will be supervised by a researcher from one of the participant groups in the Master, as well as in other public or private research centers related to the subject of the Master.

5.3.Program

The development of the subject *Master's Degree Final Project* involves:

An exhaustive bibliographic search.

Design, planning and development of experiments.

Evaluation of the results by means of the use of structural characterization techniques.

Elaboration a descriptive report with scientist format (Memory) of the research results.

Public presentation and defense of the research work.

5.4.Planning and scheduling

The *Master's Degree Final Project* will be developed following a schedule by mutual agreement between the tutor and the student, regarding the timetable of other subjects and observing the safety regulations applicable to a research laboratory, up to completing a minimum dedication to work equivalent to 24 ECTS.

The supervisor of the *Master's Degree Final Project* will provide the student with the material required for the development of the research project. The student, under the supervision of the director, will carry out autonomously the search for general and specific bibliography on the subject's research project.

The dates for the presentation and defense of the Master's Final Project will be published well in advance in the notice board, at the websites of the Sciences Faculty, https://ciencias.unizar.es , and the Master, http://masterqmch.unizar.es .

5.5.Bibliography and recomended resources

Manual de acogida en materia de prevención de riesgos. Normas de seguridad en los laboratorios de Química . Elena Atrián Blasco, Vanesa Fernández Moreira. Instituto de Síntesis Química y Catálisis Homogénea, 2013.

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Rodríguez, M. L.; Llanes, J. (Eds.). (2013). Cómo elaborar, tutorizar y evaluar un trabajo de fin de máster. Barcelona; Agència per a la Qualitat del Sistema Universitari de Catalunya (http://www.aqu.cat/doc/doc_18533565_1.pdf).