

66017 - Master's Dissertation

Syllabus Information

Academic Year: 2020/21

Subject: 66017 - Master's Dissertation

Faculty / School: 100 - Facultad de Ciencias

Degree: 537 - Master's in Molecular and Cellular Biology

ECTS: 30.0

Year: 1

Semester: Annual

Subject Type: Master Final Project

Module: ---

1.General information

1.1.Aims of the course

The main objectives of the FMP are:

- To enable students to acquire and practise the basic skills required to conduct experimental work in the laboratory in the fields of Molecular and Cellular Biology.
- To teach the students how to analyze and interpret the experimental data obtained and take decisions for the development of a given project.
- To ensure students acquire the knowledge and ability they will need to identify problems, and find practical and creative solutions, as well as to apply them in a research or professional context in the fields of Molecular and Cellular Biology.
- To develop their ability to present scientific work in a clear and concise manner, orally and in writing, both to the specialist as well as to a general audience, understanding the ethical and social implications involved.

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

This course, Master dissertation or Master Final Project (FMP) will consist in the development, under the supervision of a researcher involved in the Master (Tutor), of an experimental research project in which the student will put into practice and extend the knowledge and skills he/she has acquired so far.

The FMP will be carried out in one of the research groups affiliated to the postgraduate program (see section 5.5. for a list of participating research groups and publications and section 5.3 (program) for some examples of recent FMP topics).

The web page of the Science School (<http://ciencias.unizar.es>) will inform of the dates and procedures for both the election and presentation and defense of the FMP. It is highly recommended to visit the web page of the Biochemistry and Molecular Biology department (bioquimica.unizar.es) to get information on the groups, research lines and possible tutors of FMP in order to make a choice.

The FMP can be performed preferentially throughout the whole academic year with an average weekly dedication of around 10 h but, upon agreement, it can also be developed in a semester with an average weekly dedication of 20 h.

At the end of the Master, the student will have to prepare a written report of its FMP, that will be presented and defended orally in front of a three-member committee. The committee will evaluate both the structure and contents of the written report as well as the student communication capacity and mastering of the project's research field.

Both the FMP written report, as well as the oral defense can be performed in English or in Spanish.

2.Learning goals

2.1.Competences

2.2.Learning goals

The main objectives of the FMP are:

- To enable students to acquire and practise the basic skills required to conduct experimental work in the laboratory in the fields of Molecular and Cellular Biology.
- To teach the students how to analyze and interpret the experimental data obtained and take decisions for the development of a given project.
- To ensure students acquire the knowledge and ability they will need to identify problems, and find practical and creative solutions, as well as to apply them in a research or professional context in the fields of Molecular and Cellular Biology.
- To develop their ability to present scientific work in a clear and concise manner, orally and in writing, both to the specialist as well as to a general audience, understanding the ethical and social implications involved.

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

The student will have to prepare a written report of its FMP, that will be presented and defended orally in front of a three-member committee. The committee will evaluate both the structure and contents of the written report as well as the student communication capacity and mastering of the project's research field. A written report by the project tutor or the student general performance will also be considered for the final vote.

In the case of fraud or total or partial plagiarism in any tasks detected by the evaluation committee, the student will fail to pass the assessment and will receive the minimum vote. In addition the supervision commission (CGCM) could adopt further punishment decisions.

Both the FMP written report, as well as the oral defense can be performed in English.

The evaluation committee will consider (**See details at:**
<https://ciencias.unizar.es/master-en-biologia-molecular-y-celular-2014-15>):

1. **Written FMP memory** (60% of final vote). A 40-60 page written report containing the following sections: Title, Introduction, Hypothesis and Objectives, Methodology, Results, Discussion, Conclusions and Bibliography.
2. **Oral presentation and defense** (30% of final vote). A public presentation of the work during around 15 minutes followed by a discussion with the committee members of around 15 minutes.
3. **Project tutor report on the student's general performance** (10% of final vote).

The FMP will be evaluated in any of the official periods established by the Sciences School. The written memory will be presented typically around 8 school days before the day established for the oral defense.

The precise dates for the FMP defense and the composition of the evaluation committee will be published in the School web page and in the Biochemistry Department boards. Typically the defense periods will be in July (1st-15th) and September (15th-30th).

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

This course is intended to develop and apply the theoretical knowledge acquired by the student during the Master's degree. The main objectives of the Master's dissertation are to enable students to acquire and practise the basic skills required to conduct experimental work in the fields of Molecular and Cellular Biology, to analyze and interpret experimental data obtained, and to develop their ability to present scientific work in a clear and concise manner both to the specialist and to a general audience.

For these purposes, the dissertation will be carried out in one of the research groups affiliated to the postgraduate program under the supervision of a Tutor/s. The dissertation can be done either throughout the whole academic year, with an average weekly dedication of around 10 hours (preferred), or in a semester with an average weekly dedication of 20 hours.

At the end of the Master's, the student will have to prepare a written report of its dissertation, which will be presented and defended orally in front of a three-member committee. The committee will evaluate both the structure and contents of the written report as well as the student communicative ability and mastering of the project's research field.

Both the Master's dissertation written report as well as the oral defense can be performed in English or in Spanish.

(See details at: <https://ciencias.unizar.es/master-en-biologia-molecular-y-celular-2014-15>)

4.2. Learning tasks

The main learning activities of this course are:

1. The tutor will propose a specific scientific problem to the student (an hypothesis that has to be checked). The student should research the problem's background to solve it, through the study of the corresponding publications, thesis or previous studies related to it. The student should try to answer questions such as: What is known about this problem? What similar problems have been solved and how?
2. The Tutor of the Master's dissertation will guide the student to design the experiments required to solve the problem. They will plan together the different research stages and a schedule for it.
3. The student will learn and apply the experimental methods required to obtain the results that will help answer the problem.
4. The student will learn to analyze and interpret the results, and to discuss them and plan new experiments with the help of the Tutor.
5. The student will learn to prepare a scientific memory with the following sections: Title, Introduction, Hypothesis and Objectives, Methodology, Results, Discussion, Conclusions and Bibliography. For this purpose the Tutor will supervise and help the student.
6. The student will prepare an oral presentation of the work developed according to the time and content guidelines.

The Faculty of Science website (<http://ciencias.unizar.es>) will inform of the dates and procedures for both the selection and defense of the dissertation. It is highly recommended to visit the website of the Biochemistry and Molecular Biology department (bioquimica.unizar.es) to get information on the groups, research lines and possible tutors of FMP in order to make a choice.

4.3. Syllabus

There is not a specific syllabus for this course. Each student will organize the required activities according to the Tutor's guidelines.

Examples of recent Master's dissertation topics:

- **?Procaroyotic FAD synthetases (FADS): a potential pharmacologic target in therapy. Analysis of structure-function relationships and inhibitor design?. (Supervisors: Dr. Milagros Medina and Dr. Ana Serrano, BMCBD and BiFi)**
- **?Tumor stem cell activation effects of Granzyme A induced inflammation in colorectal carcinoma?. (Supervisor: Julian Pardo, IACS)**
- **?Development and validation of a an immunochemical test for the diagnosis of invasive aspergillosis?. (Supervisor: Julian Pardo, IACS)**
- **?Multifunctional nanoparticles for transport and selective delivery of anti-hepatitis C (VHC) drugs" (Supervisor: Olga Abian, BiFi)**
- **?Identification and characterization of new ionic channel modulators for the treatment of neurological and cardiovascular diseases?. (Supervisor: Ralf Kohler, UIT-IACS)**
- **?Functional analysis of polymorphisms in promoters involved in lipid metabolism?. (Supervisors: Miguel Pocoví e Isabel de Castro BMCBD and IACS)**
- **"Melatonin effect on the ovine reproductive system" (Supervisors: Adriana Casao Gascón and Rosaura Perez Pe, BMCBD Veterinary School)**
- **?Functional effects of directed mutations in human Apoptosis Inducing Factor (hAIF)?. (Supervisors: Dr. Patricia**

Ferreira and Dr. Raquel Moreno-Loshuertos, **BMCBD and BiFi**)

- ?Search for pharmacological chaperones to rescue MeCP2 mutations involved in Rett syndrome?. (**Supervisors:** Dr. Adrián Velázquez Campoy and Dr. Olga Albian, BiFi-IACS)
- ?In vitro antitumoral effects of BH3-mimetic compounds combined with the proteosomal inhibitor Carfilzomib and with PARP-1 inhibitor Olaparib?. (**Supervisor:** Isabel Marzo, **BMCBD**)
- ?Role of mtDNA genetic polymorphisms in Parkinson's disease?. (**Supervisors:** Julio Montoya and Eduardo Ruiz-Pesini, **BMCBD**)

4.4. Course planning and calendar

The list of available Master's dissertations with a title, and the contact address of the tutor(s) will be published according to the Faculty and the Department's guidelines, and the Master's coordinator will inform the enrolled students. (See details at: <https://ciencias.unizar.es/master-en-biologia-molecular-y-celular-2014-15>)

Each student will organize the required activities according to the dissertation Tutor's guidelines considering the other courses of the Master's and the 30 ECTS assigned to the dissertation course.

The dissertation will be evaluated in any of the official periods established by the Faculty of Sciences. The written report will be submitted before the established date for the oral defense, around 8 days in advance.

The exact dates for the defense and the creation of the evaluation committee will be published on the Faculty of Science webpage (<http://ciencias.unizar.es/>) and on the Department of Biochemistry's boards. Generally, the defense periods are in July (1st-15th) and September (15th-30th).

Each student will organize the required activities according to the project director (Tutor) guidelines.

The web page of the Science School (<http://ciencias.unizar.es>) will inform of the dates and procedures for both the election and presentation and defense of the FMP. It is highly recommended to visit the web page of the Biochemistry and Molecular Biology department (bioquimica.unizar.es) to get information on the groups, research lines and possible tutors of FMP in order to make a choice.

(See details at: <https://ciencias.unizar.es/master-en-biologia-molecular-y-celular-2014-15>)

4.5. Bibliography and recommended resources

There is no specific bibliography. Each project director will recommend the adequate resources to the student.