Universidad Zaragoza

Year : 2020/21

63109 - Master's Dissertation

Syllabus Information

Academic Year: 2020/21
Subject: 63109 - Master's Dissertation
Faculty / School: 100 - Facultad de Ciencias
Degree: 572 - Master's in Quantitative Biotechnology
ECTS: 30.0
Year: 1
Semester: Second semester
Subject Type: Master Final Project
Module: ---

1.General information

1.1.Aims of the course

The overall objective of the Master Project and Dissertation is to form the student as an independent researcher, to be employed in public or private companies and research institutions. In more detail, specific goals are:

- To enable students to acquire the basic skills required to conduct experimental or computational work in the fields of Molecular and Cellular Biology, Computational Biology or other fields related to Biotechnology
- To teach the students how to analyze and interpret experimental/computational data obtained and take decisions according to those results.
- To endow students with problem-solving skills, to tackle the obstacles they may find in their professional or research activity in the fields of Biotechnology and Biophysics.
- To train the students in presenting their scientific work in a clear and concise manner, in oral and in written form, both to the specialist and to the general audience.

1.2.Context and importance of this course in the degree

The Master Project (MP) will consist in the development, under the supervision of a professor involved in the Master (Tutor), of an experimental/computation research project in which the student will put into practice and extend the previously acquired knowledge and skills.

The Master Project will be carried out in one of the research groups affiliated to the postgraduate program. The MP is worth 30 ECTS, which is half the total of the Master Program; this figure should convey the relevance and weight of the MP within the Master program: it provides a real, insider, hands-on experience of the research work in some topic in Biotechnology, Biophysics, Molecular, Cell or Computational Biology, using the cutting-edge technologies available at the Biochemistry and Molecular and Cell Biology department, at the Institute for Biocomputation and Physics of Complex Systems, and at other research institutes of the University of Zaragoza.

1.3.Recommendations to take this course

The Master Thesis should be defended after the completion of the other courses of the Master Program, in the calls of July, September or December. However, a list of detailed subjects will be available in October-November: students are encouraged to contact the proposers of those research lines and to choose the Master Project no later than November (see the web page https://ciencias.unizar.es/master-en-biotecnologia-cuantitativa for detailed dates). It is recommended to start the research for the Master Project as soon as possible.

2.Learning goals

2.1.Competences

- To be able to design and implements experiments required to solve a given scientific problem taking into account the time and cost
- To be able to analyze critically his/her work and compare it with other results available in the Literature or used in

industry
- To be able to discuss results and experimental data with experts in the area of Biotechnology
- To communicate both in oral or written forms the research results, with the proper vocabulary and terminology, and using the most suitable technological tools.

2.2.Learning goals

The student, after completing the Master Project,

- will be able to do research (experimental, computational theoretical) with a high degree of independence and originality
- will apply the contents of the other courses of the master to a real research project
- will be able to communicate, orally or on paper, the results of the project to other colleagues of the same or close areas.
- will be familiar with the work at a research laboratory and/or a biotech company

2.3.Importance of learning goals

The above learning results are of fundamental importance to complete the curriculum of a researcher or technician in biotechnology, and to make him/her ready to start a career in the field.

3.Assessment (1st and 2nd call)

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

The students will have to prepare a written report (Master Thesis) about their research activity during the Master Project. Also, they will have to prepare a presentation (typically, using slides) that will be defended during an oral examination in front of a three-member examination board.
If needed, this examination can be carried on with videoconferencing tools, according to the rules established by the University of Zaragoza.
Obviously, the memory, presentation and defense will be in English, which is the official language of the Master.

The board will evaluate both the structure and contents of the Thesis as well as the student communication skills and mastery of the project's research field. A written report by the project director on the student general performance will also be considered to issue the final score.

In detail the evaluation board will consider:

1. Quality of the Master Thesis (40% of final grade): This will be a written report of 40 (recommended) to 60 (maximum) pages (excluding the appendices), written with a 11 point font, with 2.5 cm of left and right margins and 1.15-1.5 interline spacing. The thesis will present the research results and methods and include at least the following sections: Title, Introduction, Methods, Results, Conclusions and Bibliography.

2. Quality of the Oral Presentation and Defense (40% of final vote: 25% presentation, 15% debate). A public presentation of the work during around 15 minutes followed by a discussion with the committee during 30 minutes at most.

3. Report by the Master Thesis Director (20% of 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 examination. In addition the supervision commission (CGC) could adopt further actions.

The written memory will be presented typically around 8 school days before the defense. The precise dates for the defense will be communicated to the students by the evaluation board, within those established in the Science School Calendar (https://ciencias.unizar.es/calendario-y-horarios)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. The student will carry on a Master Project, supervised by a researcher with whom the student will have periodic interviews to discuss the advances and/or difficulties found. Finally, the student will have to write a Master Thesis containing the conclusions of their research following the guidelines above, and defend it in one of the available calls.

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, a model to be developed,...). The student should get acquainted with the relevant literature, and discuss with the tutor a detailed research plan, as well as a schedule for periodic meeting.
2. The student will learn and apply the experimental/computational/theoretical methods required to obtain the results.
3. The student will learn to analyze and interpret the results, and to discuss them and plan new tests with the help of the Tutor.
4. The student will learn to prepare a scientific report (the Master Thesis) according to the instructions in this guide, with the supervision of the tutor.
5. The student will prepare an oral presentation of the work developed according to the time and content guidelines, with the supervision of the tutor.

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.

4.4.Course planning and calendar

The list of available Master's dissertations, including title, description and contact coordinates 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, roughly in October or first half of November . The student will choose one topic, and present a signed agreement about the choice.

Each student will carry on the research activities under the supervision of the Tutor.

The dissertation will be evaluated in any of the official periods established by the Faculty of Sciences. The exact dates for the defense and the formation of the Evaluation Board will be published on the Faculty of Science webpage (http://ciencias.unizar.es/)

4.5.Bibliography and recommended resources