



Universitat de Lleida

# DEGREE CURRICULUM **MASTER'S THESIS**

Coordination: TAMARIT SUMALLA, JORDI

Academic year 2022-23

## Subject's general information

<b>Subject name</b>	MASTER'S THESIS			
<b>Code</b>	14708			
<b>Semester</b>	UNDEFINED			
<b>Typology</b>	Degree	Course	Character	Modality
	Master's Degree in Biomedical Research	1	COMPULSORY	Attendance-based
<b>Course number of credits (ECTS)</b>	28			
<b>Type of activity, credits, and groups</b>	<b>Activity type</b>	TFM		
	<b>Number of credits</b>	28		
	<b>Number of groups</b>	1		
<b>Coordination</b>	TAMARIT SUMALLA, JORDI			
<b>Department</b>	BASIC MEDICAL SCIENCES			
<b>Teaching load distribution between lectures and independent student work</b>	Most of the working hours will be face-to-face in the laboratory except for the period of writing the report which may be non-face-to-face (if deemed appropriate).			
<b>Important information on data processing</b>	Consult <a href="#">this link</a> for more information.			
<b>Language</b>	Catalan, Spanish or English			
<b>Distribution of credits</b>	The Master's Final Project is a practical work led by a researcher. The workload is 28 credits and therefore 700 hours of full-time laboratory work during the second half of the academic year (from February to July)			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
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## Learning objectives

- To know the rules to apply the scientific method and the dynamics of working in a research laboratory.
- To learn the techniques necessary to perform experimental work.
- Understanding the importance of planning and organizing the work and the rigor in the presentation of results.
- Understanding the importance of teamwork and cooperation among researchers.
- Being able to formulate goals for work, plan the work, conduct experiments, presented the results and draw conclusions.
- Being able to discuss and defend publicly the results of the research project undertaken in the Masters.

## Competences

### Basic Competences

CB1 Possess and understand knowledge that provides a basis or opportunity to be original in the development and / or application of ideas, often in a research context (\*)

CB2 Know how to apply the knowledge acquired and have the ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study (\*)

CB3 Being able to integrate knowledge and face the complexity of formulating judgments based on information that, being incomplete or limited, includes reflections on the social and ethical responsibilities linked to the application of their knowledge and judgments (\*)

CB4 Know how to communicate their conclusions –and the knowledge and ultimate reasons that support them– to specialized and non-specialized audiences in a clear and unambiguous way (\*)

CB5 Possess the learning skills that allow them to continue studying in a way that will have to be largely self-directed or autonomous (\*)

### General Competences

CG1 Know how to choose and apply the different methodologies of molecular, biochemical, cellular, genetic and phenotypic analysis for the diagnosis and study of diseases.

CG2 Know how to plan and execute a research project following the scientific method and appropriate technology with a high degree of initiative and commitment.

CG3 Ability of team-working, leadership and decision making.

CG4 Capacity for critical and creative thinking with their work and that of other researchers

CG5 Ability to prepare, process and interpret the results obtained rigorously and applying the appropriate technologies

CG6 Know how to guide research to lines of medical and translational interest (diagnosis and therapy)

CG7 Be able to present scientific reports and scientific articles that can be considered for publication in international journals

### Specific Competences

CE1 Recognize and value the importance of studies carried out in various unicellular and multicellular organisms as experimental models that are essential in the advancement of Medicine and Biomedical Sciences

CE4 Recognize high throughput techniques and be able to use bioinformatics tools for data analysis.

CE7 Know how to identify the important molecules and processes in the functioning of cells and recognize the integration mechanisms of external signals that regulate complex functions such as differentiation, proliferation and survival

CE8 Be able to design and carry out experiments with animals according to the criteria of reducing the number of animals, minimizing suffering and applying alternative techniques

### Transversal Competences

CT1 Have a correct oral and written expression

CT2 Master a foreign language

CT3 Mastering ICT

CT4 Respect the fundamental rights of equality between men and women, the promotion of Human Rights and the values of a culture of peace and democratic values

## Subject contents

The student and the supervisor will design the research project to be developed by the student during the period of the master. Based on a hypothesis they will define the main goals of the project and plan the experimental work.

The student will join the research group and learn the skills needed to develop his project, perform the experiments, analyze the results and draw conclusions.

At the end of the experimental period, the student will prepare a written report of the work done and he/she will publicly present his/her work to a committee composed of three master's professors.

## Methodology

The process of teaching and learning will take place through the following activities:

- Tutoring with supervisor
- Preparation of a project
- Practical laboratory work
- Computer user training
- Teamwork
- Individual written work
- Oral communication

## Development plan

### 1. Definition and characteristics of the Master's Thesis

The Master's Thesis (TFM) consists on the execution of an original research project by using all the knowledge and competences acquired during the Master studies. The TFM may be carried out as part of the habitual research activity of a group therefore the subject can be related to any of the Master's subjects. The TFM will be conducted under the supervision of a master professor or an outside director. In this case the student will have a tutor inside the master.

### 2. Election of TFM project

The student can choose to perform the TFM in a group of IRBLleida or external, depending on his/her preferences on the investigation subject.

On the website there are available some TFM offers from IRBLleida research groups ([www.bioteconlogiasalut.udl.cat/ca/ofertes-TFM](http://www.bioteconlogiasalut.udl.cat/ca/ofertes-TFM)). However the student should not be limited to those offers, but he/she can contact directly with researchers working on projects of interest.

TFM coordinator will guide and help to find a group those students who are doubtful or not easily find what they seek.

### 3. Inscription of TFM

Once the student has a project supervisor, he/she must fill-in the application for TFM registration and submit it to the coordinator of the Master (before the first week of February)

#### 4. Performance of experimental work

The student can join the research group from the beginning of the Master, and so he/she can start to learn techniques that will require in their work. From February to June, the student will be devoted full time to complete the realization of the experimental part of the TFM.

With the help of the supervisor, the student must hypothesize, define the objectives and plan the experiments. He/she will learn all research techniques needed, will perform the experiments and finally analyze the results to draw conclusions.

#### 5. TFM memory

The TFM memory must be written on a scientific report format with the following structure:

- Abstract (maximum 500 words)
- Introduction
- Hypothesis and Objectives
- Materials and methods
- Results
- Discussion
- Conclusions
- Bibliography

The memory will have a length of **30-50 pages** with Arial/Helvetica font (minimum size 11) and 1,5 spacing.

The student will deposit 3 printed copies to the Coordinator of the Master within the deadlines indicated by the coordinator. An electronic copy (pdf file) must be presented using "Activities" in the Virtual Space of "Treball Final de Màster" (14708). Aproximately deadlines are the following:

1st term: end June

2nd term: half October (by request).

#### 6. Oral Defense

The oral and public defense will consist on a presentation of not more than **15 minutes** and a discussion with the evaluation committee. The total time for the defense of the TFM can not exceed 30 minutes.

## Evaluation

#### Composition of the Evaluation Committee

The committee that will evaluate the TFM will be composed of 3 members. One of them can be an external professor and/or investigator of the master. Two members will be proposed by the Academic Committee of the Master (Evaluator-1 and 2) and the Master's coordinator will act as evaluator-3. The Academic Committee will decide the evaluator alternates.

#### Evaluation of the TFM.

The evaluation of the TFM will be done on the basis of the evaluation rubrics stated at the virtual campus of TFM.

The TFM director will grade the execution of the experimental work and the student attitude by filling-in the "Fitxa d'avaluació del director".

Each member of the committee will grade the student, considering the written scientific report and the oral defense by filling-in the "Fitxa d'avaluació de la comissió".

The final score will be calculated as the average of the grades from the evaluation committee and the director.

## Bibliography

- Rodríguez, ML, Llanes, J (2013). Cómo elaborar, tutorizar y evaluar un TFM. Agència per a la Qualitat del Sistema Universitari de Catalunya  
[http://www.aqu.cat/doc/doc\\_18533565\\_1.pdf](http://www.aqu.cat/doc/doc_18533565_1.pdf)
- Englander, Karen (2014). Writing and publishing science research papers in English.  
<https://link.springer.com/book/10.1007%2F978-94-007-7714-9>
- Birkenkrahe, Marcus (2014). Using storytelling methods to improve emotion, motivation and attitude of students writing scientific papers and theses. In Proceedings of 2014 IEEE 13th International Conference on Cognitive Informatics and Cognitive Computing, ICCI\*CC 2014, (Institute of Electrical and Electronics Engineers Inc.), pp. 140–145.  
<https://ieeexplore.ieee.org/document/6921453>
- Unwalla, Mike (2017). Software for Checking Style and Grammar in Scientific Writing. IEEE Potentials 36, 38–40.
- Duke Graduate School Scientific Writing Resource (website)  
<https://sites.duke.edu/scientificwriting/>