Universitat Autònoma de Barcelona

2020/2021

Master's Dissertation

Code: 42912
ECTS Credits: 12

Degree	Type	Year	Semester
4313792 Neurosciences	OB	0	2

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

Name: Vicente Martínez Perea

Email: Vicente.Martinez@uab.cat

Use of Languages

Principal working language: english (eng)

Prerequisites

According to the characterisitcs of this module, the students must have a host research group (and a research supervisor) in order to fulfill the requirements of the module.

Due to the structure of the master program, all students should have passed module 3 (Scientific Skills in Neuroscience) before starting to develop his/her research project.

Good knowledge of English and skills to work with databases and literature search programs is highly recommended.

Objectives and Contextualisation

The ultimate goal of this module is to have a public presentation and defense of a research work in an area of expertise related to neuroscience and performed by the student, under the appropriate guidance by an expert (advisor) in the field.

Specific objectives of this module are:

- Develop working capacities at a scientific laboratory, primarely related with the neuroscience field.

- Develop communication skills at the written and spoken levels.

- Develop the ability to desing, develop and defend a research strategy based on a proposed objective(s).

- Develop the ability to communicated scientific data to a broad spectrum audience, not necessarily with the same scientific background.

- Develop the capacity of integration, synthesis and abstraction.

- Develop the ability to discuss scientific data in an open environment, to accept criticisms and to present appropriate refusals taking into account the scientific knowledge.

- Develop working capacities and collaborative skills in multidisciplinary environments.

Competences

- Communicate and justify conclusions clearly and unambiguously to both specialised and non-specialised audiences.
- Conceive, design, develop and synthesise scientific projects in the field of neurosciences.
- Explain the basis of treatments for pathologies of the nervous system.
- Identify and use the techniques for studying the neurobiological substrate of behaviour, neurodegenerative processes, neuroprotective strategies and strategies of plasticity of the nervous system.
- Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
- Recognise the anatomical and cellular structure of the nervous system, the cell biology of the different types of neuron and of the glial cells, and formulate experimental approaches to their study.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.

Learning Outcomes

1. Accept and encourage scientific debate as a way towards professional growth.
2. Adapt to working in multidisciplinary teams in varying cultural and scientific contexts, creating and fostering a climate of open collaboration and team spirit.
3. Communicate and justify conclusions clearly and unambiguously to both specialised and non-specialised audiences.
4. Communicate orally and in writing the conception, development, results and conclusions of a research project.
5. Defend research work carried out by relating it to the current state of knowledge.
6. Efficiently present research work and findings in neurosciences, orally and in writing, using English.
7. For the master's dissertation, combine knowledge of anatomy and cell biology of the nervous system.
8. For the master's dissertation, use experimental techniques for the morphological study of elements of the nervous system.
9. Implement complex experiment protocols, analyse and interpret results and put these into context.
10. In the master's dissertation, apply the necessary techniques for studying the neurobiological substrate of behaviour, neurodegenerative processes, neuroprotective strategies and strategies of plasticity of the nervous system.
11. In the master's dissertation, base arguments on the treatments used in pathologies of the nervous system.
12. Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
13. Seek out information in the scientific literature using appropriate channels, and use this information to formulate and contextualise a research topic.
14. Show responsibility in information and knowledge management.
15. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.

Content

This module has three main parts:

1. Laboratory work: this is done within a research group within the area of neuroscience or related fields.
2. Written report (Master Thesis)
3. Public dissertation and defense

Meta-analysis or literature review-based works are not accepted as a research project.

While the specific laboratory work of each student is a matter of the student's advisors, here we provide guidelines on formal aspects of the written report and the dissertation (oral defense), together with the criteria the committee will take into account for grading purposes (see Methodology and Evaluation).

POSSIBLE MODIFICATIONS:

These contents may be modified (prioritized or reduced) in accordance with the possible restrictions imposed by the health authorities.

Methodology

A. Research project

To be developed by each student under the guidance of an advisor.

This implies laboratory work; including design, realization and analysis of one or more experiments, depending upon the project developed.

A. Report

The written report should have the general structure of a scientific paper. Some indications are given below, however, specific information will be provided via Campus virtual and at the web page of the master (https://masterneurociencies.uab.cat/en/programme/module-6-research-project)
Overall, authors instructions from *Journal of Neuroscience* must be followed.

A1. Language

The report may be written in any of the official languages of the UAB: Catalan, Spanish, or English.

A2. Text

The written report should contain 25-35 numbered pages. Times 12 is the only accepted font. Line spacing should be 1.5.

A3. Figures and Tables

Figures and Tables should be embedded within the text. Legends to figuresand tables may be written in a smaller letter size.

A4. General organization

The report should be organized under the following headlines (in this order):

- Title page. Including: Title, author's name, name of supervisor and location
- Certificate from supervisor (detailled instructions will be found in the Aula Moodle)
- Index (table of contents)
- List of abbreviations
- Abstract (limit of 250 words)
- Introduction: it should not be a comprehensive review; rather, a concise set up of the question.
- Objectives (specific aims of the research project): these should be numbered and be as concise as possible.
- Materials and Methods
- Results
- Discussion (Results and Discussion may be combined)
- Conclusions: these should derive from the experimental work, in line with the objectives. Avoid atomization of conclusions. Regardless of the language chosen for the rest of the report, conclusions must be written in English.
- References (40 maximum) (Journal of Neuroscience citation style must be followed).

B. Public dissertation

B1. General

The research project will be presented in a public session to an evaluating committee of three experts in the field of Neurosciences. The combined scientific expertise of the committee members, who will be appointed by the module coordinator, will cover the main research programs of the INstitute of Neuroscience. Each student will have a 10-15 min to center the question, lay the objectives, explain the results and put them in context, and present the conclusions of his/her work. Afterwards, the committee will discuss the presentation with the student during a period of time at the committee's consideration.

B2. Language

The student and the committee members may use any of the official languages of the UAB: Catalan, Spanish, or English.

B3. Visual support

Presentations will be supported with slides, but movies or blackboard may also be used alone or in combination.

POSSIBLE MODIFICATIONS:
The proposed teaching methodologies may undergo some modification depending on the possible restrictions on attendance (face-to-face activities) imposed by the health authorities.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Research project execution	250	10	10, 11, 13, 6, 14, 9, 7, 2, 12, 15, 3, 8
Type: Supervised			
Writing of report - Including literature search and data mining	49.75	1.99	1, 10, 11, 13, 6, 4, 5, 14, 7, 12, 15, 3, 8

Assessment

The research project requires only a total of about 300 hours of the student's time. Consequently, for successful completion the student is not required to present a whole account of any problem relevant to neuroscience, but an introduction to the basics of biological science. Therefore, evaluation will be based primarily on the student's ability to:

- make hypotheses
- design, carry out and interpret experiments that test the hypotheses
- draw conclusions from such experiments, and
- communicate the complete process in an effective manner (even to non-experts in the subject)

The potential "scientific impact" of the work will not constitute a priority in terms of the final qualification.

Final scores are decided by an evaluation committee, taking into account three parts:

- Written report - 20% of the final score

- Audiovisual support for oral presentation - 20% of the final score

- Oral presentation and defense - 60% of the final score

Detailled indications of the scoring procedure and the rubrics of evaluation to be used will be available at the Aula Moodle of the subject.

The student will obtain the qualification of NOT EVALUABLE if he/she does not present the written report within the established deadlines and/or he/she does not present and defense his/her work.

POSSIBLE MODIFICATIONS:

Student's assessment may experience some modifications depending on the possible restrictions to face-to-face activities enforced by health authorities.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Audiovisual support for oral presentation	20%	0	0	10, 11, 6, 4, 14, 9, 7, 12, 15, 3, 8
Oral presentation and defense of reasearch project	60%	0.25	0.01	1, 10, 11, 6, 4, 5, 14, 7, 12, 15, 3, 8
Written report	20%	0	0	1, 10, 11, 13, 6, 4, 14, 9, 7, 2, 12, 15, 3, 8

Bibliography

The are no specific references.