Universitat Autònoma de Barcelona

2019/2020

Masters Dissertation

Code: 43427
ECTS Credits: 15

Degree	Type	Year	Semester
4314939 Advanced Nanoscience and Nanotechnology	OB	0	2

Contact

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Use of Languages

Principal working language: english (eng)

Teachers

Jordina Fornell Beringues

Prerequisites

Ideally, the students should have taken the State-of-the-Art and Research Methodologies module before.

Objectives and Contextualisation

The Master's Thesis is aimed at introducing the students to R&D in Nanoscience and Nanotechnology (N+N) through an experimental, theoretical or simulation approach. The students will gain knowledge on several techniques involved in one or more aspects of the design, preparation, handling, manufacturing, characterization and applications of nanomaterials and related nanodevices.

The Final Master Thesis (15 ECTS) should serve as a synthesis of skills and knowledge acquired during the full Master's program and it is built on the outcome of a previous bibliographic/work planning -*State-of-the-Art and Research Methodologies* (9 ECTS)-.

The Final Master's Thesis will be developed within a research group under the supervision and direction of a teacher (director). A teacher/researcher belonging to any of the Departments/Institutions (CNM, ICN2 or ICMAB) involved in the Master or a professional working in the master field in other public or private institution can be appointed as a Master's Thesis Director. In all cases the Director shall hold a doctoral degree. If the Director does not belong to the Universitat Autònoma de Barcelona, nor he/she is a master teacher or a researcher at CNM, ICN2, or ICMAB, a tutor might be appointed by the Master's Committee.

Competences

- Analyse research results to obtain new products or processes, assessing their industrial and commercial viability with a view to transferring them to society
- Communicate and justify conclusions clearly and unambiguously to both specialised and non-specialised audiences.
- Continue the learning process, to a large extent autonomously
- Design, plan and carry out a research project in nanoscience and nanotechnology.
- Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.

- Show expertise in using scientific terminology and explaining research results in the context of scientific production, in order to understand and interact effectively with other professionals.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
- Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.

Learning Outcomes

1. Analyse research results to obtain new products or processes, assessing their industrial and commercial viability with a view to transferring them to society.
2. Apply concepts and theories appropriately to prepare a research paper on a topic related to nanoscience and nanotechnology.
3. Carry out a research project.
4. Communicate and justify conclusions clearly and unambiguously to both specialised and non-specialised audiences.
5. Continue the learning process, to a large extent autonomously
6. Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
7. Interpret experimental findings from a research project related to nanoscience and nanotechnology and reach reasoned conclusions.
8. Set and prioritise objectives, resources and processes to carry out a successful research project.
9. Show expertise in using scientific terminology and explaining research results in the context of scientific production, in order to understand and interact effectively with other professionals.
10. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
11. Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.
12. Write a scientific paper and present and defend it before an audience.

Content

N/A

Methodology

Towards *the end*of the 2nd semester the students are required to deliver the Final Master Thesis report (validated by their Director/s and tutor if so) and to present an oral defense of the project to the appointed evaluation committee (constituted by three teachers/researchers).

The report should be organized as follows:

(*i*) Table of contents

(*i*) Brief summary of the project

(*ii*) Introduction: Goals/Objectives providing changes to the state-of-the-art and plannification described in annex 1 if necessary

(*iii*) Experimental details

(*iv*) Results and Discussion

(*v*) Conclusions

(*vi*) References

(*vii*) Annex: *Research Methodologies* report (previously delivered as a single file)

The inclusion of an article published or accepted for publication into the report is also accepted. In such a case the main body of the report can be shortened depending on the nature and length of the article presented.

The report must be written in English. The maximum length of the Final Master Thesis report is 30 pages. This page limit excludes the Annex. An optional CD with supplementary material can be included. A hard copy of the report should be delivered to each member of the Evaluation Committee. A pdf copy should be sent by E-mail to the Master Coordinator.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Oral Defense	40	1.6	1, 9, 6, 4
Tutorial Support Sessions	5	0.2	8, 9, 12, 4, 11
Writing and Oral Defense of the Final Master Thesis Report	314	12.56	1, 2, 8, 12, 3, 7, 6, 10, 5, 11

Assessment

The Evaluation Committee is appointed by the Master's Committee and consists of three teachers and a substitute teacher. One of them acts as the Secretary. According to the regulations applying to this kind of projects at UAB, the Evaluation Committee will be the same through the entire academic year.

The Master Thesis defense will consist in the public presentation of the research work developed by the student. The oral presentation should not exceed 20 min. The Evaluation Committee members will afterwards discuss with the student on all aspects of the work presented for a maximum length of 30 min.

The examination schedules to which students can sign up will be announced every academic year. There will be two periods (July and September, and exceptionally one in February). The exact dates and venue of the oral presentations will be announced in due course.

Students must notify the Master's Coordinator on the tentative title, Director (and tutor if so) of the Final Master Thesis as soon as available. Likewise and no later than mid-May, the students should inform of the period chosen to present the Final Master Thesis (i.e., July or September).

A copy of the Final Master Thesis report should be delivered to each member of the Evaluation Committee and a digital copy (in pdf format) should be sent by email to the Master's Coordinator two weeks before the oral defense.

The evaluation committee will consider the quality of the research work and the report, as well as the oral presentation/defense of the project.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Oral presentation	50%	2	0.08	1, 9, 12, 3, 6, 4
Report	50%	14	0.56	1, 2, 8, 3, 7, 10, 5, 11

Bibliography

N/A