



COURSE: MASTER THESIS

SUBJECT: Master Thesis

MODULE: Master Thesis

PROGRAM: Master's degree in Materials Science and Engineering

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GENERAL CHARACTERISTICS*

Type: Basic training, Compulsory, Optional

Master Thesis, External practices

Duration 810 h

Semester / s: 3

Number of ECTS credits 30

Languages: Catalan, Spanish, English

DESCRIPTION

BRIEF DESCRIPTION AND JUSTIFICATION

Work Master's Thesis (hereinafter TFM) consists in conducting a research project or individual project engineering in a research group at IQS, in an external research institution or a company.

The theme of the TFM must conform to the objectives and competences of the Master's Degree. The offer of master thesis topics is presented before the start of the semester in which the TFM is developed. Based on this offer, students will contact the thesis supervisor to plan the progress of the TFM.

With the same academic guarantees, and always under the guidance of a professor at IQS, the TFM may be made in other institutions, such as other domestic or foreign universities, public and private research centers, or companies with which it has been established the corresponding agreement.

The TFM will lead to a written work and defense before an evaluation panel. The TFM is carried out in the last semester of the Master. Its ordinary duration is 6 months with the presentation and defense of work.

BASIC COMPETENCES

- CB6 - To have and understand the necessary knowledge that provides the ground or opportunity to be innovative in the development and/or application of ideas, often in a research context.
- CB7 - To apply their knowledge and their ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study.

* These features should not be modified without the approval of the bodies responsible for academic higher-level structures (field, module and / or system).

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- CB8 - To integrate knowledge and deal with the complexity of formulating judgments based on information, which, being incomplete or limited, includes reflections on social and ethical responsibilities related to the application of their knowledge and judgments.
- CB9 - To communicate conclusions and the reasons that sustain them, to specialized and non-specialized audiences in a clear and unambiguous way
- CB10 - To understand the need for life-long learning in a self-directed or autonomous way.

GENERAL COMPETENCES

- CG1 - The ability to lead, direct and manage projects in academic or business environments adapting to the structures, needs and ways of operation of each institution.
- CG2 – The ability to perform a responsible practice of the profession.

TRANSVERSAL COMPETENCES

- T1 - Ability to communicate in English and to use English as a working language.
- T2 - Ability to lead and manage work teams.
- T3 - Ability to assess the impact of the use of materials on the sustainable development of society.

SPECIFIC COMPETENCES

- E11 - Ability to design, plan and / or conduct experiments to synthesize concrete materials and to interpret the results of experiments conducted to determine the structure of these materials.
- E21 - Possess useful knowledge, including theoretical and practical, for the practice of Materials Science and Engineering aspects.
- E23 - Ability to plan, implement, manage and present a research project in the area of Materials Science and Engineering.
- E24 - Ability to develop activities of fundamental and applied research and innovation in academic and industrial environments by integrating projects and interdisciplinary activities.

PREVIOUS REQUIREMENTS*

a) TFM carried out at IQS

To start the TFM student must have to overcome 50 ECTS out of the 60 ECTS of the modules corresponding to the first and second semester of the master.

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b) Carried out at another institution (university, research center or company) domestic or foreign.

To start the TFM at another university, research center or domestic or foreign company must have to overcome 50 ECTS out of the 60 ECTS of the modules corresponding to the first and second semester of the master.

In the event that the TFM is conducted at a university, research center or foreign company the student must demonstrate proficiency on the official language of the receiving center or an adequate level of English.

c) TFM carried out through ERASMUS Study type mobility in universities with TFM of 30 ECTS or higher.

To start the TFM ERASMUS mobility, the student must have exceeded 50 ECTS out of the 60 ECTS of the modules corresponding to the first and second semester.

The student must demonstrate to possess the language skills that require the host university.

CONTENTS

During the TFM period the student is integrated in the discipline and policy of the research group (or department) of IQS or the research group (or administrative unit) external to IQS (university, research center or company) under the responsibility of the director (or directors of the TFM) to which shall report the results and consult the difficulties encountered and participate in follow-up meetings of the research group, seminars, etc

After the end of the experimental part of the TFM or the corresponding part of an engineering project and according to the director (or directors) thereof, the student should initiate the preparation of the corresponding memory required for the presentation and defense of the TFM.

For the presentation and defense of the TFM the student must have passed the all the ECTS of all the modules of the Master.

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METHODOLOGY

TRAINING ACTIVITIES*

Training activities	ECTS credits	Competences
practical / laboratory work	21.8	E11, E21, E23, E24, T1, T2, T3, CB7, CB8, CB9, CB10, CG1, CG2
Presentations	0.4	E23, E24, T1, T2, T3, CB7, CB8, CB9, CG1, CG2
Personal study activities	7.7	E23, E24, T1, T2, T3, CB6, CB7, CB8, CB9, CB10, CG1, CG2
Evaluation activities (tests, monitoring controls ...)	0.1	E23, E24, CB9, CG1, CG2
TOTAL	30	

TEACHING METHODOLOGY

Performing laboratory activities or similar (computer practices, projects, workshops, etc.) by the student, under the direct supervision of a professor.

Oral presentation to a professor and possibly other students by a student. It may be a paper prepared by the student by searching the published literature or a summary of practical work or project undertaken by the student.

Student's personal work necessary to acquire the skills of each subject and assimilate the knowledge presented in the sessions of exhibition concepts and exercises solving sessions, problems and cases, using, where necessary, the recommended bibliography

Oral and / or written tests performed during the period of study of a subject or once finished it.

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EVALUATION

ASSESSMENT METHODS *

Assessment methods	Weight	Competences
Defense before evaluation panel	30%	E23, E24, T1, T3, CB6, CB7, CG1, CG2
Papers and presentations	20%	E23, E24, T3, CB8, CB9, CB10, CG1, CG2
Experimental or field work	50%	E11, E21, E23, E24, T1, T2, T3, CB6, CB7, CB8, CB9, CB10, CG1, CG2

LEARNING OUTCOMES

- The student must demonstrate ability to lead a research project. (E23, E24, T1, T2, T3, CG1)
- The student must demonstrate that he/she can plan and develop a research project. (E23, E24, T1, T2, T3)
- The student must demonstrate the ability to work in teams. (E23, E24, T1, T2, T3)
- The student must demonstrate learning skills for achieving the project objectives. (E23, E24, T1, T2, T3)
- The student must demonstrate the ability to interpret results obtained in experiments to determine the structure or properties of the materials studied, whether metallic, ceramic, polymeric, composite or homogeneous or heterogeneous formulations organic or inorganic products.(E11)
- The student must be able to demonstrate theoretical and practical knowledge to the practice of Materials Science and Engineering, as well as its ability to integrate them into its research strategy TFM. (E21)

QUALIFICATION

The thesis supervisor will deliver to the Dean office, before the date set by the Dean, and prior to the defense of the TFM before an evaluation panel, a report on the student performance. The report shall contain information on:

- 1) The rating of the experimental work or field (50% final note)
- 2) The scientific assessment of technical skills, written communication skills and teamwork, understanding and future need for continuing education, etc.
- 3) Comments, including comments on student performance and behavior.

At the time of the public defense, the evaluation panel will qualify:

- 1) Defense before the evaluation panel (30% final note)
- 2) Work and presentation (20% final note)

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3) The evaluation panel will complete the assessment of the competences.

ASSESSMENT OF THE COMPETENCIES

Competences Students' ability to:	Note (0 to 10)	Comments
Apply the acquired knowledge and their ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study (CB7).		Evaluated by thesis supervisor EXPERIMENTAL WORK (50% grade)
Perform a responsible practice of the profession (CG2). Assess the impact of the use of materials on sustainable development of society (T3).		Evaluated by thesis supervisor
Design, plan and perform experiments to synthesize specific materials, as well as to interpret the results of experiments to determine the structure of these materials (E11)		Evaluated by thesis supervisor
Have useful complementary knowledge, including theoretical and practical aspects, for the practice of Science and Materials Engineering (E21)		Evaluated by thesis supervisor
Possess the learning skills that enable them to continue studying in a way that will be largely self-directed or autonomous (CB10).		Evaluated by thesis supervisor
Communicate in English and use English as a working language (T1).		Evaluated by thesis supervisor
Lead and manage teams (T2).		Evaluated by thesis supervisor

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Competences Students' ability to:	Note (0 to 10)	Comments
have and understand the required knowledge that provides the basis or opportunity to be innovative in the development and/or application of ideas, often in a research context (CB6).		Assessed by the evaluation panel of the TFM WORK / TEXT - (20% overall grade)
integrate knowledge and deal with the complexity of formulating judgments based on information which, being incomplete or limited, includes reflections on social and ethical responsibilities related to the application of their knowledge and judgments. (CB8). communicate conclusions and the reasons that sustain them, to specialized and non-specialized audiences in a clear and unambiguous way. (CB9).		Assessed by the evaluation panel of the TFM PRESENTATION (30% overall grade)
Lead, direct and manage projects in academic or corporate environments adapting to the structures, needs and ways of operation of each institution (CG1). Plan, implement, manage and present a research project in the area of Materials Science and Engineering (E23). develop fundamental and applied research activities and innovation in academic and industrial environments by integrating projects and interdisciplinary activities (E24).		Assessed by the evaluation panel of the TFM QUALIFICATION - Minutes (Grade in SIGMA)

BIBLIOGRAPHY

- Each project will have its own specific literature

DOCUMENT HISTORY

PREVIOUS REVISIONS

October 1, 2016 - Carles Colominas

October 19, 2015 - Carles Colominas

CURRENT REVISION

February 26, 2019 - Carles Colominas