

Course guide 2301222 - TFM MSM - Master's Thesis

Last modified: 29/05/2025

Academic year: 2025	ECTS Credits: 10.0 Languages: English
Degree:	MASTER'S DEGREE IN SEMICONDUCTOR ENGINEERING AND MICROELECTRONIC DESIGN (Syllabus 2024). (Project subject).
Unit in charge: Teaching unit:	Barcelona School of Telecommunications Engineering 230 - ETSETB - Barcelona School of Telecommunications Engineering.
Unit in charges	Parcelana School of Telecommunications Engineering

LECTURER

Coordinating lecturer:

Others:

LEARNING RESULTS

Knowledges:

KT01. Identify semiconductor devices, technological processes, the most appropriate microelectronic design tools, and relationships between these elements in order to integrate a given product or system into microelectronic technologies.

KT02. Describe the current state of scientific research and microelectronic industrial technology worldwide and their economic, social and environmental impact.

KT03. Describe the physical principles underlying current semiconductor devices in relation to their application, as well as their emerging trends, modelling and characterisation techniques.

KT04. Identify and describe the different manufacturing and characterisation processes in microelectronics and their applicability according to the functional and cost requirements of the final integrated product.

KT05. Describe the main methods and tools used to design integrated circuits and systems in accordance with the required functional specifications and cost of the final integrated product.

KT06. Identify and describe the main verification and test strategies for integrated circuits and systems according to their application. KT07. Identify gender stereotypes and roles and how they may impact professional practice.

Skills:

ST01. Design integrated devices, circuits and systems for new products according to their applications, taking into account sustainability and energy efficiency requirements.

ST02. Apply the manufacturing techniques and processes and design, simulation and characterisation tools of semiconductor engineering and microelectronic design to provide a solution to a specific integrated system proposal.

ST03. Critically analyse the principles, values and procedures that govern the practice of the profession.

ST04. Select appropriate sources of information from the scientific and technical literature, using appropriate channels, and integrate this information, demonstrating the ability to synthesise information, analyse alternatives and engage in critical debate.

ST05. Communicate the results of one's work, the conclusions reached and the knowledge and reasoning underlying them clearly, concisely and unambiguously to specialist and non-specialist audiences, both orally and in written technical and/or scientific documents.

ST06. Plan the different activities involved in successfully carrying out an assigned task within a team, managing time and resources appropriately.

ST07. Work as part of a heterogeneous team that includes supervisors and specialist and non-specialist members.

Competences:

CT01. Design new devices and integrated systems that require the use of manufacturing techniques specific to microelectronic technologies or the use of microelectronic design tools.

CT02. Apply sustainability criteria to projects based on integrated microelectronic products.

CT03. Apply the processes of semiconductor engineering and microelectronic design to fields in diverse areas of science or engineering where integrated systems are required.

CT04. Generate questions and hypotheses, propose methodologies to address new research and innovation challenges, and demonstrate originality in approaching and solving problems requiring integrated solutions in microelectronic technologies.



TEACHING METHODOLOGY

Each student will be assigned a thesis advisor. The advisor and the student together prepare a working plan. During the development of the thesis, they hold periodical meetings where the advisor advises the student on next steps to follow. Most of the time the student works autonomously. At the end, the student prepares the technical report and performs the public presentation of the results.

LEARNING OBJECTIVES OF THE SUBJECT

Apply the knowledge acquired in the degree to develop an engineering project in the field of Semiconductor Engineering and Microelectronic Design, which synthesizes the skills acquired during the Master's studies. Explain and document the project developed in a technical report, and present and defend it publicly.

CONTENTS

Final Màster report

Description:

TFM contents depend on the project to develop

Specific objectives:

Develop an original work, individually, consisting of an engineering project in the field of the Semiconductor Engineering and Microelectronic Design, which summarizes the skills acquired to the teachings of the Master, and defend it before a university examination committee.

Related activities: It will depend of the selected topic.

Full-or-part-time: 50h Guided activities: 50h

GRADING SYSTEM

The TFM is evaluated by a board assigned for that purpose. The evaluation board consists of a President, a Secretary and one other Board Member. The Secretary of the evaluation board is the TFM advisor, the President is, normally, a professor of the same department than the Secretary, and the third member is a professor of another department than the President and the Secretary. In order to determine the numerical mark of the TFM, the evaluation board will take into special account the scientific or technical quality of the work and technical report, the clarity of the presentation and oral defence, response to questions and, if applicable, the economic feasibility study, environmental impact and/or sustainable development.