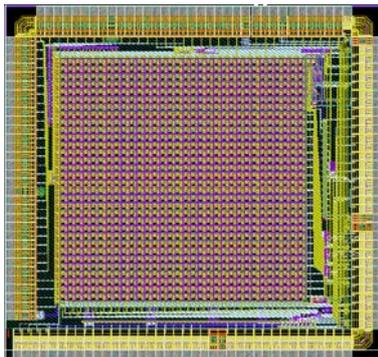


# MASTER'S DEGREE IN ELECTRONIC ENGINEERING

## Introduction

The master's degree in Electronic Engineering (MEE) is a flexible training proposal built on a long academic experience in the field. It is adaptable to the needs of both: students who wish to focus on a professional career and those who want to further research through a PhD. in the area of Electronics.

This master's degree provides graduates with a broad profile that includes skills and expertise in Energy Management, Micro and Nano Technologies, Integrated Systems and Biomedical Engineering and Sensors.



*Integrated circuit for image processing  
designed by AHA research group*

It is intended that cutting-edge industry assimilates these engineers as reference professionals in the new multidisciplinary work and production scenario. In order to promote the employability of our students, both the master's thesis and some of the ECTS credits for free elective subjects can be taken at companies or laboratories. The student is helped by an academic supervisor to design the optimum track along the master.

MEE also has a strong international character. It is taught entirely in English attracting a large number of students from other countries. For

local students, the international mobility through Erasmus program is encouraged. Additionally, it is also possible to obtain a joint degree with other internationally renowned universities.

## Language of instruction

Courses are taught in English. It is required a Common European Framework English Level B2.

## General requirements

Admission requirements include an official Spanish university degree or a four-year bachelor's degree awarded by a university that is part of the European Higher Education Area and that entitles the holder to seek admission to a master's degree in the country in which it was awarded, in one of the academic subjects covered by the master's degree.

Applicants with a degree awarded by a university in a country that is not part of the European Higher Education Area do not need to obtain official recognition for the degree.

More information:

<http://www.upc.edu/learning/courses/masters-degrees/access-and-admission/access-requirements>

## Specific requirements

Students enrolling at MEE typically have one of the following degrees:

- Bachelor's degree in Electronic Systems Engineering
- Bachelor's degree in Engineering Physics
- Bachelor's degree in Industrial Electronics and Automatic Control Engineering

- Bachelor's degree in Telecommunications Technologies and Services Engineering
- Bachelor's degree in Telecommunications Science and Technology
- Bachelor's degree in Audiovisual Systems Engineering
- Bachelor's degree in Telecommunications Systems Engineering
- Bachelor's degree in Network Engineering
- Bachelor's degree in Electrical Engineering
- Five-year degree in Telecommunications Engineering (enginyer superior de telecomunicació): 30 ECTS credits may be recognised
- Five-year degree in Electronic Engineering (enginyer superior electrònic): 60 ECTS credits may be recognised
- Diploma in Telecommunications Engineering (enginyer tècnic de telecomunicació): additional 30 ECTS credits must be passed
- Diploma in Electronic Engineering (enginyer tècnic en electronica): an additional 30 ECTS credits must be passed.

Applicants who have other technology degrees in fields such as computer engineering, software engineering, informatics engineering, etc. may need to pass some courses in addition to those of the master's degree. These courses are part of the bachelor's degree in Telecommunications Technologies and Services Engineering and are taught in Catalan or Spanish. The maximum number for these courses is 60 ECTS. The exact number of additional ECTS credits depends on the degree held by the applicant and will be decided by the master degree's academic committee.

**97.4%**  
Graduate employment

**36** Teaching  
practice laboratories

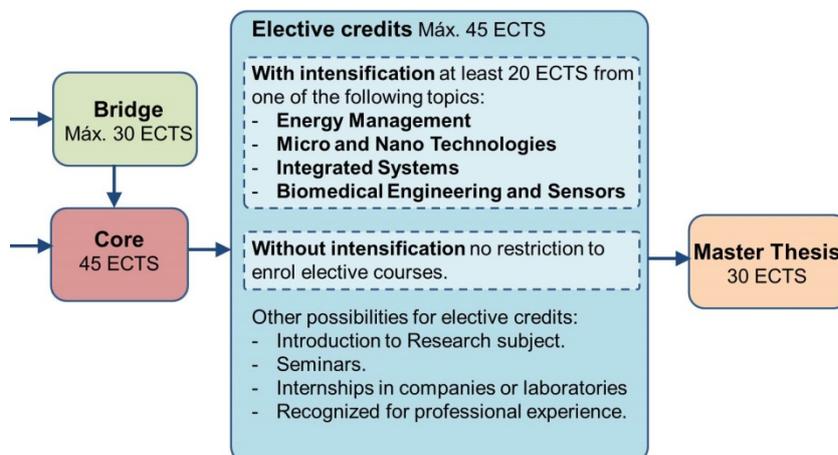
**15 ECTS**  
Internships in companies

## Curriculum

There are two main tracks in MEE:

- **Academic path without intensification:** If you want maximum flexibility in the elective subjects, choose this option. There are 45 compulsory ECTS credits and 45 ECTS to choose among the different elective options without any restriction. The master thesis has 30 ECTS
- **Academic path with intensification:** If you want to be a specialist in one of the multiple areas of the electronic engineering, choose this option. There are 45 compulsory ECTS credits and among the 45 ECTS elective credits a minimum of 20 ECTS must be chosen from the intensification of your interest. The four intensification tracks are: Energy Management, Integrated Circuits, Biomedical Engineering and Sensors and Micro and Nano Technologies. If the student fulfils this requirement, the school will certified the followed intensification track. The final thesis has 30 ECTS.

Subjects are structured in different blocks:



- **Bridge subjects:** To be taken by students whose academic profile is not a general bachelor of electronic engineering. The Academic Commission of Masters assigns these courses to new students. These subjects do not extend the master, they use elective credits.
- **Core subjects:** Compulsory subjects.
- **Elective credits:** These credits can be divided between:
  - Elective subjects: every course several elective subjects are offered. In addition, elective subjects from another masters can be enrolled, always under supervisor approval.
  - Introduction to research subject (15 ECTS): this subject consists of a small research project developed in one of the research groups of the Electronics Engineering Department.
  - Seminars: short courses given in the period between semesters, February or July.
  - Internships in companies or laboratories (15 ECTS).
  - Recognized for professional experience (15 ECTS maximum).
- **Master's Thesis.**

## Internships in companies

It is also possible to perform internships in companies (<http://www.etsetb.upc.edu/ca/emprses/convenis-de-cooperacio-educativa/informacio-per-a-estudiants>).

In the master's framework, these internships can be curricular equivalent to 15 elective ECTS, curricular to do the master's thesis or extracurricular (do not recognize credits). The ETSETB has a long collaboration tradition with companies. In next link you may see the companies that have offered internships during the last years:

<http://www.etsetb.upc.edu/ca/emprses/convenis-de-cooperacio-educativa/empreses-amb-convenis>

## Competencies

Once the student has been awarded the Master degree, he will have demonstrable skills in the following competencies:

- The ability to model, design and control power electronic systems for various functions and applications.
- The ability to conceive and design electronic circuits for RF analogue signal processing.
- The ability to design, implement and integrate high-performance instrumentation systems.
- The ability to analyse, design and fabricate micro- and nanoelectronic devices.
- The ability to analyse and design digital circuits and systems-based (multi) processors and configurable devices.
- The ability to analyse and design mixed-signal integrated circuits.

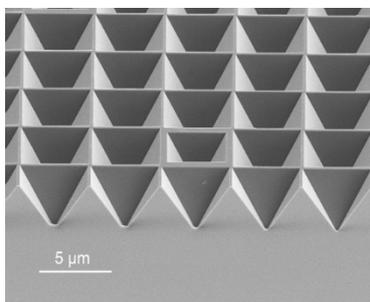
- The ability to manage and generate innovative business projects in the field of electronic technology.

## Professional opportunities

Given the cross-disciplinary characteristics of electronics, graduates of this master may pursue careers in a broad range of sectors related to electronic technology, such as ICT systems, electron devices, medical electronics, consumer electronics, control systems, robotics, automation, electromagnetic compatibility, microelectronic design, smart sensors and data acquisition systems, etc.

Companies operating in these sectors offer high added value in terms of technology and are therefore in need of professionals trained to master's degree level. Many of these companies foster technology innovation and have a highly dynamic presence in a strongly competitive market, that they achieve by counting research among their activities. Additionally, graduates can be also employed in the public sector including civil servants or employees of any public administration body at the EU, national, regional and local levels in the areas of electronics and ICT innovation, research, development and innovation specialists in public universities.

In addition to professionally oriented topics, the master's degree offers highly specialised optional subjects intended for those students who are looking to pursue a **doctoral degree in Electronic Engineering**.



*Crystalline silicon texturization processed at the clean room facilities by MNT research group*

## Labour Market

The document "Universities and Employment in Catalonia 2014" analyses the employability of students who graduated in the 2009-2010 academic year.

The most significant labour market data for electronic engineers are the following:

- A graduate employment rate of 97.4%.
- It takes 88.6% of graduates less than three months to find their first job.
- Of students who graduated in the 2009-2010 academic year, 90.3% earn over €2,000 a month.
- Electronic engineering is in second place in the ranking of degree courses according to the Job Quality Index.

The UPC is the top Spanish university in the area of Information and Communication Technologies, according to the Everis Foundation ranking of universities-companies, about employability of new graduates.

## Duration and start date

Two academic years, 120 ECTS credits. Starting September and February.

## Timetable and delivery

Afternoons. Face-to-face.

## Fees and grants

Approximate **fees** for the master's degree: €6,295 (€9,442 for non-EU residents).

**Scholarships** for the degree: there are several ways to get funding for MEE. For an updated information visit MEE's web page indicated below.

## More information:

**Barcelona School of Telecommunications Engineering (ETSETB):** <http://www.etsetb.upc.edu>

**MEE:** <http://www.etsetb.upc.edu/ca/estudis/masters/master-en-enginyeria-electronica-mee>

[masters@etsetb.upc.edu](mailto:masters@etsetb.upc.edu)

# MASTER'S DEGREE IN ELECTRONIC ENGINEERING



UNIVERSITAT POLITÈCNICA  
DE CATALUNYA  
BARCELONATECH

**ETSETB**  
BARCELONA SCHOOL OF TELECOMMUNICATIONS ENGINEERING

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