

Master's degree in Electronic Engineering (MEE)

The **master's degree in Electronic Engineering** ([master's degree website](#)) caters for the needs of two types of students: those who wish to focus on a professional career and those looking to pursue a doctoral degree in Electronic Engineering.

This master's degree provides graduates with a broad profile that includes skills and expertise in power, analogue and RF electronics, instrumentation and sensors, digital systems, micro and nanotechnologies, and microelectronics. After the first, compulsory subject area, students can choose from a wide variety of subjects in order to acquire a general profile, specialise in a field, or engage in research and pursue a doctoral degree.

The aim is for the graduates to enter modern industry as benchmark professionals in a new multidisciplinary work and production scenario. To increase their employability, students can take both the master's thesis and some of the ECTS credits for optional subjects in a company or laboratory.

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

GENERAL DETAILS

Duration and start date

1.5 academic years, 90 ECTS credits. Starting September and February

Timetable and delivery

Afternoons. Face-to-face and blended learning

Fees and grants

Approximate fees for the master's degree, excluding other costs, €2,490 (€3,735 for non-EU residents).

Scholarships for the degrees

- **Fórum TIC**: 1 scholarship with a grant of €3,000.
- **HP**: 1 scholarship with a grant of €2,773.35, and an additional employment contract linked to the duration of the scholarship.
- **HP Academy**: 1 scholarship with a grant that covers the enrollment expenses of the master's degree, with a work contract linked to the duration of the scholarship.
- **Telecogresca**: 1 scholarship for the 1st.

[More information about grants and scholarships for the degree](#)

[More information about fees and payment options](#)

[More information about grants and loans](#)

Language of instruction

English

Information on [language use in the classroom and students' language rights](#).

Location

[Barcelona School of Telecommunications Engineering \(ETSETB\)](#)

Official degree

[Recorded in the Ministry of Education's degree register](#)

ADMISSION

General requirements

Specific requirements

This 90-credit master programme consists of three semesters which can be approximately divided in: core, specialisation and thesis. The syllabus of the first semester is compulsory, depending on the admission level. The syllabus of the specialisation semester is optional and focuses on both professional training and research. There are four specialisations: Power Electronics, Devices and Microsystems, Integrated Circuits and Systems, and Instrumentation and Measurements.

Some of the students who are not graduates of the bachelor's degree in Electronic Systems Engineering or the equivalent from another university may require bridging courses to get the background needed for the core subjects. The maximum number of ECTS credits that students are allowed to earn for **bridging courses** is 25 and they use elective credits are reduced but they do not extend the duration of the master.

Typical admission profiles:

- Bachelor's degree in Electrical / Electronic Engineering may be admitted to the core semester.
- Bachelor's degree in Telecommunications Engineering, Computer Students may be admitted to different levels of the master programme on the basis of the subject of their degree and their academic CV. In case some bridge courses are needed, they will use elective credits and will not extend the duration of the master.
- Students admitted to the official postgraduate programme for the doctoral degree in Electronic Engineering who are required to take bridging courses may be admitted to the specialisation subjects. Students from the pre-EHEA-second cycle degree in Electronic Engineering who have completed all core and compulsory subjects may also be admitted to the specialisation subjects.

Admission criteria

Language requirements:

CEFR English Level B2, which you can demonstrate in one of the following ways:

- Your mother tongue is English.
- You have studied in an English-speaking country (for at least one semester).
- You have taken an academic university programme taught in English (for at least one semester).
- You hold a European Higher Education Area degree that includes English Level B2.
- You hold one of the following English language certificates:
 - Cambridge: FCE
 - TOEFL PBT: ≥ 567 ; CBT: ≥ 227 ; IBT: ≥ 87
 - IELTS: 5.5
 - TOEIC: 750
 - Escuela Oficial de Idiomas: Certificado de nivel avanzado (Level 5)
- You obtain a B2 [English certificate at the UPC](#)

Knowledge of Catalan and Spanish may be helpful for daily life. Find more information on the [Language services and resources at the UPC website](#).

Places

40 in September; 20 in February

Pre-enrolment

Pre-enrolment period open.

Expected deadline: 04/07/2022.

[How to pre-enrol](#)

Enrolment

[How to enrol](#)

Legalisation of foreign documents

All documents issued in non-EU countries must be [legalised and bear the corresponding apostille](#).

Professional opportunities

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

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, which they achieve through research.

Labour market

Every three years, the Catalan University Quality Assurance Agency (AQU) publishes a study on the employability of Catalan university graduates.

The last of these studies analyses the employability of students who graduated in Electronic Engineering at 2020.

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

- The graduate employment rate is 97.0% with 96.9% of full-time jobs.
- 93.5% earns more than 2.000€ / month
- Electronic engineering is in second place in the ranking of degree courses according to the Job Quality Index.

The Everis Foundation has issued a ranking of universities based on companies' views on the employability of new graduates. The UPC is the top Spanish university in the area of information and communication technologies (ICTs).

Competencies

Generic competencies

Generic competencies are the skills that graduates acquire regardless of the specific course or field of study. The generic competencies established by the UPC are capacity for innovation and entrepreneurship, sustainability and social commitment, knowledge of a foreign language (preferably English), teamwork and proper use of information resources.

Specific competences

On completion of the course, students will be able to:

- Model, design and control power electronic systems for various functions and applications.
- Conceive and design electronic circuits for RF analogue signal processing.
- Design, implement and integrate high-performance instrumentation systems.
- Analyse and design micro- and nanoelectronic devices within the margins of use.
- Analyse and design digital circuits and systems-based (multi-) processors and configurable devices.
- Analyse and design mixed-signal integrated circuits.
- Manage and generate innovative business projects in the field of electronic technology.

ORGANISATION: ACADEMIC CALENDAR AND REGULATIONS

Organizing teaching center

- [Technical School of Telecommunications Engineering of Barcelona \(ETSETB\)](#)

Academic program manager

- [Isidro Martín García](#)

Academic calendar

- [General academic calendar for degrees, masters and doctorates](#)
- [Current course \(Class timetable, calendar of masters, exams, teachers, ...\)](#)

Academic regulations

- [Academic regulations for masters at the UPC](#)
- [Specific academic regulations for the MET and MEE masters](#)

Academic and administrative procedures

- [Pre-enrollment, registration, master's thesis, ...](#)
- [Mobility agreements to carry out the master's thesis at universities and foreign companies](#)
- [Business practices](#)

List of courses and teaching guide

- [Bridge](#)
- [Core](#)
- [Elective](#)

CURRICULUM

MEE CURRICULUM

Master MEE offers 2 types of academic paths:

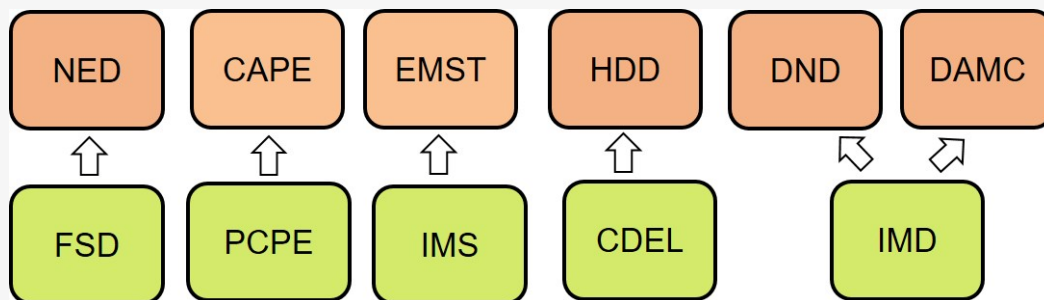
- **Academic path without intensification:** If you want maximum flexibility in the elective subjects, choose this option. There are 35 compulsory ECTS credits and 35 ECTS to choose among the different elective options without any restriction. The master thesis has 20 ECTS.
- **Academic path with intensification:** If you want to be a specialist in one of the multiple areas of the electronic engineering, choose this option. There are 35 compulsory ECTS credits and among the 35 ECTS elective credits a minimum of 15 ECTS must be chosen from the intensification of your interest. 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 electrical/electronic engineering. The Academic Commission of the master assigns these courses to new students. These subjects do not extend the master as they use elective credits. In the following figure, the relation between bridge subjects and core subjects is shown. This information could be useful for students that are not comfortable with the level of the core or bridge subject because is too high or too low. At the beginning of every semester, this mismatch can be solved by replacing the enrolled subject by the corresponding subject of higher or lower level.

Bridge subjects' list:

- Fundamentals of semiconductor devices (FSD)
- Principles of control and power electronics (PCPE)
- Introduction to measurements systems (IMS)
- Configurable digital electronics (CDEL)
- Introduction to microelectronic design (IMD)



- **CORE SUBJECTS:** Compulsory subjects. There is a lot of flexibility enrolling these subjects. The only limitation to consider is that in case of being assigned some bridge subjects, do not enrol the core subjects related to them until you have passed the bridge course (see figure above).

Core subjects' list:

- Design of Analog Microelectronic Circuits (DAMC)
- Control and Applications in Power Electronics (CAPE)
- Electronic Measurement Science and Technology (EMST)
- High-level Digital Design (HDD)

- [Digital Nanoelectronic Design \(DND\)](#)

- [Nanotechnologies and Electron Devices \(NED\)](#)

- [Entrepreneurship and Innovation for World Challenges \(EIWC\)](#)

- **ELECTIVE SUBJECTS:** If the student does not want to follow any of the intensification tracks, any of the available elective subject can be chosen. In case of following an intensification track, the student must do a minimum of 15 ECTS of elective subjects from the chosen intensification track (**Energy Management, Integrated Circuits, Biomedical Engineering and Sensors, Micro and Nano Technologies**). If the student fulfils this requirement, the school will certify the followed intensification track.

- **ELECTIVE CREDITS:** Apart from elective subjects, these credits can be done with another activities like:
 - Introduction to Research subjects

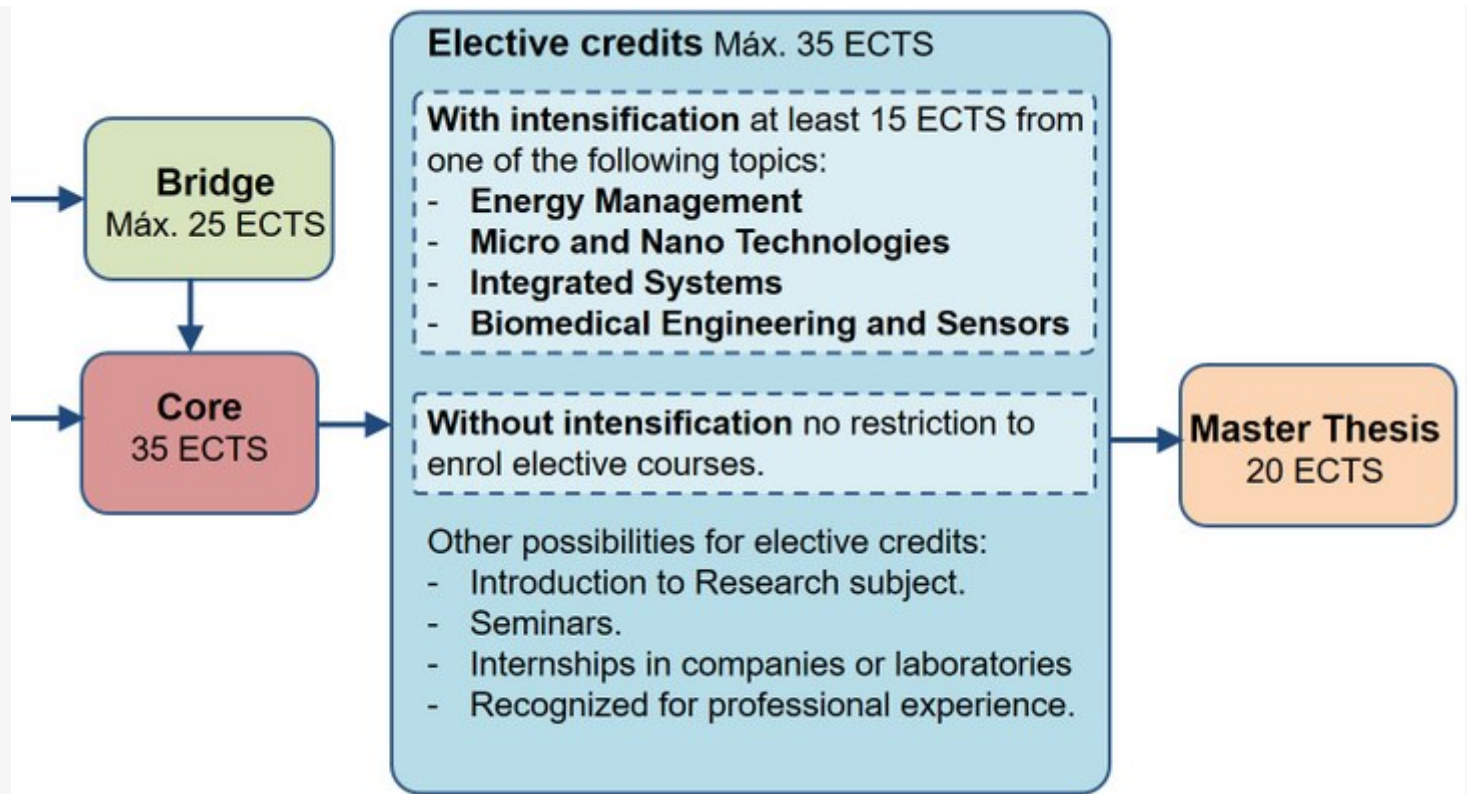
 - Seminars

 - Internships in companies or laboratories (10 ECTS)

 - Recognized for professional experience in master's degree (10 ECTS maximum).

- **MASTER'S THESIS:** The duration is 20 ECTS. You can develop Master thesis in companies or at the research groups. Check in [Departament d'Enginyeria Electrònica](#) to see the different research groups where the student can develop his thesis.

MASTER STRUCTURE



ENROLMENT GUIDE

First semester (30 ECTS): 6 core subjects.

Second semester (30 ECTS): The rest of core subjects except MTP + elective subjects. Without restrictions.

Third semester (30 ECTS): Elective subjects+ Master thesis (20 ECTS). Without restrictions.

In case that bridge subjects are required, these will be enrolled in first and second semesters depending on the subject availability and the academic profile of each applicant.

Students can make [mobility stays](#) of half or full year to choose among a great number of foreign universities. Usually, the period is the third semester and/or the master's thesis during the fourth semester.

In case that the student is taking a double degree or a mobility stay all compulsory subjects must be passed during first and second semesters.

INTERNSHIPS IN COMPANIES:

It is also possible to perform [internships in companies](#). In the master's framework, these internships can be curricular equivalent to 10 elective ECTS, curricular to do the master's thesis or extracurricular (do not recognize credits). In the following [link](#) a list of companies that have received students in the last years can be found.