

Master's degree in Automotive Engineering

The **master's degree in Automotive Engineering** aims to provide multidisciplinary training for automotive engineers. Students develop high-level competencies that allow them to easily adapt to positions of responsibility in companies or research centres in the sector. The objective is for students to acquire knowledge of the theoretical and practical fundamentals of automotive engineering and technology related to the production of automotive vehicles. The subjects on the programme allow students to acquire knowledge and develop skills related to body engineering, components, electricity and electronics, assisted driving, management, etc.

According to the specialisation they choose, students will gain in-depth knowledge of some of these areas.

- Engines and Mechanics (taught at the ETSEIB)
- Electromobility (taught at the ETSEIB)
- Connected Vehicles and Assisted Driving (taught at the ETSETB)

Specialisations

- Engines and Mechanics
- Electromobility
- Connected Vehicles and Assisted Driving

GENERAL DETAILS

Duration and start date

Two academic years, 120 ECTS credits. Starting September

Timetable and delivery

Afternoons. Face-to-face

Fees and grants

Approximate fees for the master's degree, excluding degree certificate fee, €6,535 (€9,802 for non-EU residents).

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

[More information about grants and loans](#)

Language of instruction

80% of the subjects are taught in Spanish and 20% in Catalan.

Location

[Barcelona School of Industrial Engineering \(ETSEIB\)](#)

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

Official degree

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

ADMISSION

General requirements

[Academic requirements for admission to master's degrees](#)

Specific requirements

Applicants seeking admission to this master's degree should be university graduates with one of the following scientific

or technical degrees:

- A bachelor's degree in Industrial Technology Engineering, Materials Engineering, Industrial Design and Product Development, Electrical Engineering, Industrial Electronics and Automatic Control, Mechanical Engineering, Telecommunications Systems, Electronic Systems or Engineering Physics.
- A pre-EHEA degree in Industrial Engineering; Industrial Engineering with a concentration in Mechanics, Manufacturing Technologies or Transports and Vehicles; Materials Engineering; Telecommunications Engineering; Automatic Control and Industrial Electronics; Electronic Engineering; or Physics.
- A pre-EHEA diploma in Mechanical Engineering, Electrical Engineering or Electronic Engineering.

Admission criteria

- English level B2.2 and Spanish level B2 (foreign students) are required.
- Academic record.
- First degree and university of origin.
- Professional experience.

Places

40

Pre-enrolment

Pre-enrolment closed (consult the new pre-enrolment periods in the [academic calendar](#)).

[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](#).

DOUBLE-DEGREE AGREEMENTS

Double-degree pathways at a single school

- Master's degree in Automotive Engineering + Master's degree in Industrial Engineering (ETSEIB)

Double degrees with foreign universities

- Bachelor's degree in Industrial Technology Engineering + Master's degree in Automotive Engineering and Diplôme d'ingénieur from one of the Écoles Centrales (Lille, Lyon, Marseille, Nantes, Supélec).

PROFESSIONAL OPPORTUNITIES

Professional opportunities

Graduates may pursue careers in the automotive sector—with automotive manufacturers or in the supplier industry—or at RDI centres. The training provided enables students to develop a strong technological profile and prepares them to fill positions related to a wide range of activities and departments, including product engineering and development; design and management of production and logistics; technological management and innovation; RDI; development and innovation in products, processes and methods; new technologies and new management systems; automotive project management; strategic consulting, etc.

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 competencies

On completion of the course, students will:

- Know the principles of calculation and design of automotive bodywork.

- Know the principles of aerodynamics.
- Have acquired a theoretical and practical grounding in steering, suspension and brake systems and their effect on the dynamic behaviour of vehicles.
- Be familiar with the various transmission systems used in the driveline.
- Be familiar with the power and injection systems of reciprocating internal combustion engines (RICE) and their combustion processes.
- Be able to analyse the environmental impact of RICE and apply techniques to control and minimise pollution.

ORGANISATION

UPC school

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

Academic coordinator

[Joaquim Bautista Valhondo](#)
[Juan Manuel Moreno Eguilaz](#)

Academic calendar

[General academic calendar for bachelor's, master's and doctoral degrees courses](#)

Academic regulations

[Academic regulations for master's degree courses at the UPC](#)

CURRICULUM

Subjects	ECTS credits	Type	
FIRST SEMESTER			
Automobile Dynamics	6	Compulsory	
Connected Vehicle	6	Compulsory	
Electric and Electronic Systems in the Automobile	6	Compulsory	
Models and Tools of Decision Science	6	Compulsory	
Vehicle Body Parts	6	Compulsory	
Specialisation in Connected Vehicle and Driver Assistance Branch	Automobile Dynamics	6	Compulsory
	Connected Vehicle	6	Compulsory
	Electric and Electronic Systems in the Automobile	6	Compulsory
	Models and Tools of Decision Science	6	Compulsory
	Vehicle Body Parts	6	Compulsory
Specialisation in Electromobility Branch	Automobile Dynamics	6	Compulsory
	Connected Vehicle	6	Compulsory
	Electric and Electronic Systems in the Automobile	6	Compulsory
	Models and Tools of Decision Science	6	Compulsory
	Vehicle Body Parts	6	Compulsory

Subjects		ECTS credits	Type
Specialisation in Motors and Mechanics Branch	Automobile Dynamics	6	Compulsory
	Connected Vehicle	6	Compulsory
	Electric and Electronic Systems in the Automobile	6	Compulsory
	Models and Tools of Decision Science	6	Compulsory
	Vehicle Body Parts	6	Compulsory
SECOND SEMESTER			
	Análisis Estructural	4.5	Optional
	Automotive Safety Systems	4.5	Compulsory
	Car Materials	4.5	Optional
	Hybrid and Electric Vehicles	6	Compulsory
	Innovation and Development in Automotive	3	Compulsory
	Internal Combustion Engines and Fuels I	4.5	Optional
	Legislation and Homologation	4.5	Compulsory
	Product Planning	3	Compulsory
	Quality Management	4.5	Optional
Specialisation in Connected Vehicle and Driver Assistance Branch	Análisis Estructural	4.5	Optional
	Automotive Safety Systems	4.5	Compulsory
	Car Materials	4.5	Optional
	Hybrid and Electric Vehicles	6	Compulsory
	Innovation and Development in Automotive	3	Compulsory
	Internal Combustion Engines and Fuels I	4.5	Optional
	Legislation and Homologation	4.5	Compulsory
	Product Planning	3	Compulsory
	Quality Management	4.5	Optional
Specialisation in Electromobility Branch	Análisis Estructural	4.5	Optional
	Automotive Safety Systems	4.5	Compulsory
	Car Materials	4.5	Optional
	Hybrid and Electric Vehicles	6	Compulsory
	Innovation and Development in Automotive	3	Compulsory
	Internal Combustion Engines and Fuels I	4.5	Optional
	Legislation and Homologation	4.5	Compulsory
	Product Planning	3	Compulsory
	Quality Management	4.5	Optional

Subjects		ECTS credits	Type
Specialisation in Motors and Mechanics Branch	Análisis Estructural	4.5	Optional
	Automotive Safety Systems	4.5	Compulsory
	Car Materials	4.5	Optional
	Hybrid and Electric Vehicles	6	Compulsory
	Innovation and Development in Automotive	3	Compulsory
	Internal Combustion Engines and Fuels I	4.5	Optional
	Legislation and Homologation	4.5	Compulsory
	Product Planning	3	Compulsory
	Quality Management	4.5	Optional
THIRD SEMESTER			
Production Management		6	Compulsory
Supply Chain Management in Automotive		4.5	Compulsory
Specialisation in Connected Vehicle and Driver Assistance Branch	Adas and Radio Frequency Systems	6	Compulsory
	Automotive Artificial Intelligence	4.5	Optional
	Embedded Systems	4.5	Compulsory
	ICT Technologies and New Mobility Services	4.5	Optional
	Software Architecture and Evaluation	4.5	Compulsory
	Telematics	6	Compulsory
	Production Management	6	Compulsory
	Supply Chain Management in Automotive	4.5	Compulsory
Specialisation in Electromobility Branch	Batteries	4.5	Compulsory
	Electrical Motors	6	Compulsory
	Fuel Cells	4.5	Compulsory
	Infrastructure and Electric Charging Systems	4.5	Compulsory
	Power Electronics	6	Compulsory
	Production Management	6	Compulsory
	Supply Chain Management in Automotive	4.5	Compulsory
Specialisation in Motors and Mechanics Branch	Aerodynamics	4.5	Compulsory
	Computer-Aided Engineering	4.5	Compulsory
	Internal Combustion Engines and Fuels II	4.5	Compulsory
	Steering, Suspension and Braking Systems	6	Compulsory
	Transmission Systems and Performance	6	Compulsory
	Production Management	6	Compulsory
	Supply Chain Management in Automotive	4.5	Compulsory
FOURTH SEMESTER			
Business and Organization Management		4.5	Optional
Human Resources		3	Optional
Industrial Scheduling Techniques		3	Optional

Subjects		ECTS credits	Type
Integrated Manufacturing Systems		3	Optional
Machine Testing		4.5	Optional
Master's Thesis		12	Project
Specialisation in Connected Vehicle and Driver Assistance Branch	Business and Organization Management	4.5	Optional
	Human Resources	3	Optional
	Industrial Scheduling Techniques	3	Optional
	Integrated Manufacturing Systems	3	Optional
	Machine Testing	4.5	Optional
	Master's Thesis	12	Project
Specialisation in Electromobility Branch	Business and Organization Management	4.5	Optional
	Human Resources	3	Optional
	Industrial Scheduling Techniques	3	Optional
	Integrated Manufacturing Systems	3	Optional
	Machine Testing	4.5	Optional
	Master's Thesis	12	Project
Specialisation in Motors and Mechanics Branch	Business and Organization Management	4.5	Optional
	Human Resources	3	Optional
	Industrial Scheduling Techniques	3	Optional
	Integrated Manufacturing Systems	3	Optional
	Machine Testing	4.5	Optional
	Master's Thesis	12	Project