

# Master's degree in Automotive Engineering

The **master's degree in Automotive Engineering** ([master's degree website](#)) 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

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## GENERAL DETAILS

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### 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 other costs, €5,533 (€8,300 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](#)

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## ADMISSION

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### 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

45

#### 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.

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## ORGANISATION: ACADEMIC CALENDAR AND REGULATIONS

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### UPC school

[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](#)

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## CURRICULUM

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Subjects		ECTS credits	Type
<b>FIRST SEMESTER</b>			
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
<b>Specialisation in Connected Vehicle and Driver Assistance Branch</b>	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
<b>Specialisation in Electromobility Branch</b>	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
<b>Specialisation in Motors and Mechanics Branch</b>	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

<b>Subjects</b>		<b>ECTS credits</b>	<b>Type</b>
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
Structural Analysis		4.5	Optional
<b>Specialisation in Connected Vehicle and Driver Assistance Branch</b>	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
	Structural Analysis	4.5	Optional
<b>Specialisation in Electromobility Branch</b>	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
	Structural Analysis	4.5	Optional
<b>Specialisation in Motors and Mechanics Branch</b>	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
	Structural Analysis	4.5	Optional
<b>THIRD SEMESTER</b>			
Production Management		6	Compulsory

<b>Subjects</b>		<b>ECTS credits</b>	<b>Type</b>
Supply Chain Management in Automotive		4.5	Compulsory
<b>Specialisation in Connected Vehicle and Driver Assistance Branch</b>	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	Optional
	Telematics	6	Compulsory
	Production Management	6	Compulsory
	Supply Chain Management in Automotive	4.5	Compulsory
<b>Specialisation in Electromobility Branch</b>	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
<b>Specialisation in Motors and Mechanics Branch</b>	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
<b>FOURTH SEMESTER</b>			
Business and Organization Management		4.5	Optional
Climatic Change and Environmental Pollution		4.5	Optional
Human Resources		3	Optional
Industrial Scheduling Techniques		3	Optional
Integrated Manufacturing Systems		3	Optional
Introduction to Competition Vehicles		3	Optional
Machine Testing		4.5	Optional
Supply Chain Management for Industry		4.5	Optional
Master's Thesis		12	Project

<b>Subjects</b>		<b>ECTS credits</b>	<b>Type</b>
<b>Specialisation in Connected Vehicle and Driver Assistance Branch</b>	Business and Organization Management	4.5	Optional
	Climatic Change and Environmental Pollution	4.5	Optional
	Human Resources	3	Optional
	Industrial Scheduling Techniques	3	Optional
	Integrated Manufacturing Systems	3	Optional
	Introduction to Competition Vehicles	3	Optional
	Machine Testing	4.5	Optional
	Supply Chain Management for Industry	4.5	Optional
	Master's Thesis	12	Project
<b>Specialisation in Electromobility Branch</b>	Business and Organization Management	4.5	Optional
	Climatic Change and Environmental Pollution	4.5	Optional
	Human Resources	3	Optional
	Industrial Scheduling Techniques	3	Optional
	Integrated Manufacturing Systems	3	Optional
	Introduction to Competition Vehicles	3	Optional
	Machine Testing	4.5	Optional
	Supply Chain Management for Industry	4.5	Optional
	Master's Thesis	12	Project
<b>Specialisation in Motors and Mechanics Branch</b>	Business and Organization Management	4.5	Optional
	Climatic Change and Environmental Pollution	4.5	Optional
	Human Resources	3	Optional
	Industrial Scheduling Techniques	3	Optional
	Integrated Manufacturing Systems	3	Optional
	Introduction to Competition Vehicles	3	Optional
	Machine Testing	4.5	Optional
	Supply Chain Management for Industry	4.5	Optional
	Master's Thesis	12	Project