

Master's degree in Automatic Control and Robotics

The **master's degree in Automatic Control and Robotics** focuses on engineering in the fields of **automatic control and robotics**. It combines knowledge of industrial engineering, such as electrical and mechanical engineering, industrial electronics and some aspects of artificial intelligence.

The programme lasts two academic years and includes a master's thesis and training in an industrial or research environment. It is divided into compulsory and free-elective subjects. Compulsory subjects provide students with multidisciplinary education in automatic control systems, robotics and robotised systems in various environments; computer vision; computer technology and communication in processing elements; and scientific and technological tools. In free-elective subjects, students complete their training in their areas of interest.

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). This master's degree was selected in the Masters of Excellence grant programme of the Catalunya-La Pedrera Foundation for the 2017-2018 academic year. More information is available at the [Foundation's website](#).
[More information about fees and payment options](#)
[More information about grants and loans](#)

Language of instruction

English

Official degree

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

ADMISSION

General requirements

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

Specific requirements

The most suitable educational profiles are:

- Engineering degrees related to automatic control and robotics (Industrial, Electronic, Electrical, Mechanical, IT and Telecommunications Engineering, among others).
- Physics or Mathematics degrees.

English level B2.2 is required. In exceptional cases, for reasons pertaining to the curriculum and the adaptation of the degree required for admission, this requirement may be lowered to level B1.

Admission criteria

- English level B2.2 is required.

- Academic record.
- First degree and university of origin.
- Professional experience.

Five places will be allocated in advance on **31 March** for candidates who need admission before June for the purpose of applying for a grant or visa.

Places

30

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 Automatic Control and Robotics + Master's degree in Industrial Engineering (ETSEIB)

With foreign universities

- Master's degree in Automatic Control and Robotics (ETSEIB) + Master's degree in Automation and Control Engineering (Politecnico di Milano)
- Bachelor's degree in Industrial Technology Engineering + Master's degree in Automatic Control and Robotics and *Diplôme d'ingénieur* from one of the Ecoles Centrales (Lille, Lyon, Marseille, Nantes, Supélec).
- Bachelor's degree in Industrial Technology Engineering + Master's degree in Industrial Engineering / Master's degree in Management Engineering / Master's degree in Automatic Control and Robotics and *Diplôme d'ingénieur* from the ENSAM PARISTECH

PROFESSIONAL OPPORTUNITIES

Professional opportunities

This master's degree produces graduates who have attained a high level of excellence in the analysis, management and optimisation of process control and robotics, industrial engineering and residential, social and service environments—activities which are essential for social progress, economic productivity and quality of life.

The curriculum includes 18 ECTS credits in an optional subject area that students must take during the last semester and that allows them to focus on professional, research and innovation practice and develop high-level generic competencies.

A recent study on graduate employment in the last six years shows that 6% of the graduates of this master's degree have PhDs and are working in academia (research institutes and universities). In addition, 34% are research assistants in institutions such as the UPC, the UPV, the UIB, the UAB, the IBEC, the UPN and the UPM, in Spain, but also at Imperial College London, Karlsruhe Institute of Technology, the École Polytechnique de Montréal, the University of Texas at Austin, the University of Technology, Sydney and the National Technical University in Ecuador. A substantial proportion (30%) work for industrial firms or technology centres in Spain (DASSA Technologies, CETEMMSA, Analitzadors Assessoria Energètica, the Barcelona Provincial Council, SEAT, Thinking Forward XXI, IREC, Hewlett-Packard, ALTEN, Durán-Corretjer, Renesas Electronics and GlobalSmartDesign), in Europe (ESS AB, Shell and ASML) and across the world (Toro Development Ltd., Honeywell Process Solutions, DIMAP Ingeniería and Plenum). A number of South American graduates have returned to their posts in academia at the University of the Andes in Venezuela, the Pontifical Catholic University in Peru, the Army Polytechnic School, the Pontifical Catholic University and the National Technical University in Ecuador, and the Autonomous University of Manizales in Colombia.

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.

On finishing the master's degree, graduates will be able to:

- Undertake research, innovation and development tasks in companies and institutions.
- Conceive of systems and automate processes to increase performance, production, competitiveness, quality and the optimisation of human and energy resources.
- Include aspects of analysis, design and control in systems and processes.
- Apply these aspects to increasing performance, production, competitiveness, and quality and to optimising human and energy resources in sectors such as industry, aerospace, naval engineering, biomedicine, and natural and energy resources.

Specific competencies

- Carry out measurements and calculations.
- Create mathematical models and simulations of the problems studied.
- Monitor studies and reports.
- Identify faults and possible improvements in automated systems.
- Plan, coordinate and undertake maintenance tasks that are corrective, preventative or predictive.
- Quantitatively and qualitatively analyse the operation of processes and make improvements.
- Look for relevant information on the problems that the study is based on. Verify the state of the question and provide a solution to the problem.
- Apply knowledge to a wide range of areas: industrial, aeronautic and services in general.
- Draw up operating specifications.
- Design, draw up, execute and lead projects related to the area.
- Apply the technical and legal regulations.
- Design automatic regulation and control systems to improve the performance of systems. These should include all elements of a system.
- Combine knowledge effectively to solve multidisciplinary problems.
- Design and programme the software components needed to implement the proposed solutions.
- Take environmental effects into account in each of the solutions designed.
- Express the proposed solutions appropriately.
- Identify the problems that require special research within the field of automatic control, either because they are new or because they are difficult to solve.
- Look for the information needed to solve problems and critically analyse this information.
- Design and carry out the experiments required for research projects.
- Use computer design and modelling systems.
- Be advanced users of IT tools.
- Use IT tools for data analysis and as a support in solving problems.
- Develop advanced tools to carry out tasks related to the master's degree.
- Use, configure, and be familiar with networked computer systems.
- Apply artificial intelligence techniques to real problems.
- Incorporate systems to solve problems.

Specific academic competencies

- Work individually and in teams.
- Communicate effectively both orally and in writing.
- Be familiar with and adapt to changing environments.

Attitudes

- A desire for continuing professional improvement.
- Critical awareness.
- Ethical, socioeconomic and environmental sensitivity.
- Willingness to collaborate openly with other professionals.
- Awareness of the role of engineering in today's world.

ORGANISATION

UPC school

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

Academic coordinator

[Ramon Costa Castelló](#)

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

June 2018. [UPC](#). Universitat Politècnica de Catalunya · BarcelonaTech