

# Bachelor's degree in Industrial Electronics and Automatic Control Engineering

## Terrassa School of Industrial, Aerospace and Audiovisual Engineering (ESEIAAT)

On the **bachelor's degree in Industrial Electronics and Automatic Control Engineering**, you will acquire the knowledge needed to supervise and manage engineering projects in the fields of industrial electronics and automatic control: design and development of analogue, digital and power electronic systems and industrial control and automation systems. You will receive multidisciplinary training in the fields of analogue, digital and power electronics, systems modelling and simulation, automatic regulation and control techniques and their application in industrial automation, and the principles and applications of robotic systems, industrial informatics and communications.

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### GENERAL DETAILS

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#### Duration

4 years

#### Study load

240 ECTS credits (including the bachelor's thesis). One credit is equivalent to a study load of 25-30 hours.

#### Delivery

Face-to-face

#### Language of instruction

Check the language of instruction for each subject (and timetable) in the course guide in the curriculum.

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

#### Fees and grants

Approximate fees per academic year: €1,107 (€2,553 for non-EU residents). [Consult the public fees system based on income \(grants and payment options\)](#).

#### Location

[Terrassa School of Industrial, Aerospace and Audiovisual Engineering \(ESEIAAT\)](#)

#### Official degree

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

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### ADMISSION

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#### Places

270

#### Registration and enrolment

[What are the requirements to enrol in a bachelor's degree course?](#)

#### 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 the UPC

You have the possibility of complementing this bachelor's degree with a specific pathway towards a double degree by taking an additional number of credits from one of the other degrees taught at the School. Generally, this involves an additional year of study. To gain admission to a double degree of this kind you must have taken a minimum number of credits on one of the bachelor's degrees. The number of places is limited.

- Bachelor's degree in Industrial Electronics and Automatic Control Engineering / Bachelor's degree in Mechanical Engineering
- Bachelor's degree in Industrial Electronics and Automatic Control Engineering / Bachelor's degree in Electrical Engineering

### With other universities or centers of higher education in Catalonia

- Bachelor's degree in Industrial Electronics and Automatic Control Engineering / Master's degree in Industrial Engineering / Degree in Business Administration and Management (UOC).

## PROFESSIONAL OPPORTUNITIES

### Professional opportunities

- Drafting and supervision of projects involving automation and control installations and electronic drive regulation.
- Design, installation and maintenance of electronic control, power and instrumentation systems.
- Design and development of industrial informatics and process monitoring systems.
- Design, management and maintenance of industrial equipment and installations.
- Drafting of technical, advisory and feasibility reports.
- Management, organisation, planning and quality control.
- Teaching and research.

## ORGANISATION: ACADEMIC CALENDAR AND REGULATIONS

### Academic calendar

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

### Academic regulations

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

### Language certification and credit recognition

Queries about [language courses and certification](#)

Terrassa School of Industrial, Aerospace and Audiovisual Engineering (ESEIAAT)

### This bachelor's degree is also taught at

- Barcelona · EEBE · [Show degree](#)
- Manresa · EPSEM · [Show degree](#)
- Vilanova i la Geltrú · EPSEVG · [Show degree](#)

## CURRICULUM

Subjects	ECTS credits	Type
<b>FIRST SEMESTER</b>		
Chemistry	6	Compulsory
Environmental Technologies and Sustainability	6	Compulsory
Graphic Expression in Engineering	6	Compulsory
Mathematical Methods I	6	Compulsory

<b>Subjects</b>	<b>ECTS credits</b>	<b>Type</b>
Physics I	6	Compulsory
<b>SECOND SEMESTER</b>		
Economics and Business Administration	6	Compulsory
Foundations of Computing	6	Compulsory
Materials Science and Technology	6	Compulsory
Mathematical Methods II	6	Compulsory
Physics II	6	Compulsory
<b>THIRD SEMESTER</b>		
Electric Systems	6	Compulsory
Fluid Mechanics	6	Compulsory
Mathematical Methods III	6	Compulsory
Mechanical Systems	6	Compulsory
Production Organisation	6	Compulsory
<b>FOURTH SEMESTER</b>		
Advanced Control Systems	3	Optional
Electronic Systems	6	Compulsory
Industrial Automation and Control	6	Compulsory
Industrial Informatics	6	Compulsory
Probability and Statistics	6	Compulsory
Thermal Engineering	6	Compulsory
Uav Research & Development	3	Optional
Uav Research & Development Project	3	Optional
<b>FIFTH SEMESTER</b>		
Analogue Electronics	6	Compulsory
Digital Electronics	6	Compulsory
Industrial Automation	6	Compulsory
Modelling and Analysis of Dinamic Systems I	4.5	Compulsory
Power Electronics I	4.5	Compulsory
<b>SIXTH SEMESTER</b>		
Advanced Programming Oriented Towards Goals	3	Optional
Applied UAV Control	3	Optional
Automated Manufacture and Industrial Robotics	6	Compulsory
Autonomous Vehicle Programming	3	Optional
Big Data and Smart Grids	6	Optional
Big Data Tools and Applications	3	Optional
Characterization Techniques for Metallic Alloys	3	Optional
Control Engineering	6	Compulsory
Control System Programming in Real-Time	6	Optional

<b>Subjects</b>	<b>ECTS credits</b>	<b>Type</b>
Creative Lab	6	Optional
Creative Programming with Processing	3	Optional
Critical Thinking for 3D Printing	6	Optional
Decision Criteria - Engineer as Employee or Engineer as Entrepreneur	3	Optional
Electromobility and Electrical Aircraft Systems	3	Optional
Embedded Systems Programming	3	Optional
Energy Efficiency Systems	3	Optional
Energy Storage and Conversion Application	3	Optional
Experimental Design	3	Optional
Highly Automated Production Systems	3	Optional
Hospital Engineering	6	Optional
Information and Communication Technology	3	Optional
Introduction to Big Data	3	Optional
Introduction to Cubesats	3	Optional
Introduction to Dynamical Systems and Ergodic Theory	3	Optional
Introduction to Forensic Expert for Technique Dispute Resolution	3	Optional
Introduction to Object-Oriented Programming	3	Optional
Introduction to Reverse Engineering	3	Optional
Leadership and Professional Development in Engineering	3	Optional
Lightweight Materials for Engineering Applications	3	Optional
Mathematical Models in Engineering	3	Optional
Mathematics and Computing Engineering	3	Optional
Mobile Programming	6	Optional
Modelling and Analysis of Dinamic Systems II	4.5	Compulsory
Motorbikes Design and Secrets	3	Optional
Photovoltaic System Design	6	Optional
Power Electronics II	4.5	Compulsory
Professional Communication for Engineers Through Virtual Reality	3	Optional
Programmable Devices	6	Compulsory
Real-Time Programming and Database Systems	3	Optional
Robotics and Automation	3	Optional
Safety Robotics and Automation for Industry 4.0	3	Optional
Surface Chemistry for Industrial Applications Design	3	Optional
Technology, Society and Globalization: the Sustainability Challenge in the XXith Century	6	Optional
Uav Generative Design	6	Optional
Validating and Communicating Innovative Ideas	6	Optional
Vibroacoustics	3	Optional
Web Applications	3	Optional

<b>Subjects</b>	<b>ECTS credits</b>	<b>Type</b>
Written Academic Skills for Engineering	3	Optional
<b>SEVENTH SEMESTER</b>		
Advanced Programming	6	Optional
Advanced Robotics & Highly Automation Production Systems	6	Optional
Applications and Control of Power Electronic Systems	6	Optional
Control and Guidance of Mobile Robots	6	Optional
Electronic Instrumentation	6	Compulsory
Initiation to Paper and Graphic Industrial Technologies	6	Optional
Internship	12	Optional
Introduction to Advanced Control Systems	6	Optional
Modelisation, Complexity and Sustainability	6	Optional
Operation and Control of Electric Vehicles	6	Optional
Programming of Mobiles Android	6	Optional
Project Oriented Methodology	6	Compulsory
<b>EIGHTH SEMESTER</b>		
Agrivoltaics: Photovoltaic Solar Energy for Sustainable Development	3	Optional
Application of Python/Matlab/C++ to Thermal Engineering Mechanical and Aeronautical Problems	3	Optional
Applied Research Methods in Engineering Science	3	Optional
Basic Robotics	6	Optional
Digitalization Applied to Energy Systems	3	Optional
Electrical Project Design with Eplan	3	Optional
Electronic System Design Applied to Renewable Energy and Energy Efficiency	6	Optional
Fundamentals of Rams Engineering in the Certification of Aerospace Products	3	Optional
Hydraulic Hybrid Machines	3	Optional
Hydrogen's Future: Technologies and Applications	3	Optional
Life Cycle Assessment	3	Optional
Numerical Methods for Engineers	6	Optional
Photonics. Optics Applied to Engineering	6	Optional
Planning, Simulation and Supervision of Industrial Processes	6	Optional
Professional Communication for Engineers Through Virtual Reality II	3	Optional
R&D in Engineering	3	Optional
Sports Engineering	3	Optional
Technological Projects I	6	Optional
Technological Projects II	6	Optional
Thermal Analysis Techniques Applied to Engineering Materials	3	Optional
UAV Introduction to Drone Flight (Uas)	3	Optional
Bachelor's Thesis	24	Project

