Bachelor's degree in Electrical Engineering
Terrassa School of Industrial, Aerospace and Audiovisual Engineering (ESEIAAT)

The **bachelor's degree in Electrical Engineering** covers the technological fundamentals of the generation and distribution of electrical energy and the control and protection of electrical systems. You will acquire the skills needed to supervise and manage engineering projects related to electrical systems, high-, medium- and low-power installations, machine and industrial production line automation, and the generation and distribution of electrical energy. You will also become familiar with emerging fields such as electric traction and the development of renewable energies.

GENERAL DETAILS

Duration
4 academic 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

ADMISSION

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

With other universities or centers of higher education in Catalonia

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

PROFESSIONAL OPPORTUNITIES

Professional opportunities

- Supervision and management of engineering projects related to the design, analysis, construction, verification and maintenance of systems and equipment for generating, transporting and distributing electrical energy.
- Analysis, design, testing and control of domestic and industrial electrical installations.
- Management of electrical power systems, installations and drives.
- Design, installation and maintenance of electromechanics, automation and industrial production lines.
- Energy and environmental management.
- Energy generation in wind and photovoltaic power systems.
- 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

CURRICULUM

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

Subjects	ECTS credits	Type
SECOND SEMESTER		
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
THIRD SEMESTER		
Electric Systems	6	Compulsory
Fluid Mechanics	6	Compulsory
Mathematical Methods III	6	Compulsory
Mechanical Systems	6	Compulsory
Production Organisation	6	Compulsory
FOURTH SEMESTER		
Advanced Circuits	6	Compulsory
Advanced Control Systems	3	Optional
Electronic Systems	6	Compulsory
Industrial Automation and Control	6	Compulsory
Probability and Statistics	6	Compulsory
Thermal Engineering	6	Compulsory
Uav Research & Development	3	Optional
Uav Research & Development Project	3	Optional
FIFTH SEMESTER		
Advanced Industrial Control and Automation	6	Compulsory
Electrical Machines I	6	Compulsory
Power Electronics Processing	6	Compulsory
Power Plants and Renewable Energies	6	Compulsory
Transport of Electric Power	6	Compulsory
SIXTH SEMESTER		
Advanced Programming Oriented Towards Goals	3	Optional
Applied UAV Control	3	Optional
Autonomous Vehicle Programming	3	Optional
Big Data and Smart Grids	6	Optional
Big Data Tools and Applications	3	Optional
Calculus and Design of High Voltage Power Lines	6	Optional
Characterization Techniques for Metallic Alloys	3	Optional
Creative Lab	6	Optional
Creative Programming with Processing	3	Optional
Critical Thinking for 3D Printing	6	Optional

Subjects	ECTS credits	Type
Decision Criteria - Engineer as Employee or Engineer as Entrepreneur	3	Optional
Efficiency and Quality in Electrical Systems	6	Compulsory
Electrical Machines II	6	Compulsory
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
Fundamentals of Robotics	3	Optional
High Voltage Electrical Installations	6	Compulsory
Highly Automated Production Systems	3	Optional
Hospital Engineering	6	Optional
Information and Communication Technology	3	Optional
Introduction to Big Data	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
Low Tension Industrial Installations	6	Compulsory
Mathematical Models in Engineering	3	Optional
Mathematics and Computing Engineering	3	Optional
Mobile Programming	6	Optional
Motorbikes Design and Secrets	3	Optional
Professional Communication for Engineers Through Virtual Reality	3	Optional
Real-Time Programming and Database Systems	3	Optional
Robotics and Automation	3	Optional
Safety Robotics and Automation for Industry 4.0	3	Optional
Supervision of Electrical Systems	6	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
Written Academic Skills for Engineering	3	Optional
SEVENTH SEMESTER		
Advanced Programming	6	Optional

Subjects	ECTS credits	Type
Calculation and Construction of Electrical Machines	6	Optional
Control Technology for Electromechanical Systems	6	Optional
Energy and Climate Change	6	Optional
Grid Integration of Renewable Energy Systems	6	Optional
Initiation to Paper and Graphic Industrial Tecnologies	6	Optional
Internship	12	Optional
Machine Control and Operation	6	Compulsory
Modelisation, Complexity and Sustainability	6	Optional
Planning, Simulation and Supervision of Industrial Processes	6	Optional
Programming of Mobiles Android	6	Optional
Project Oriented Methodology	6	Compulsory
EIGHTH SEMESTER		
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
Artificial Intelligence for UAV Video Object Recognition	3	Optional
Artificial Intelligence for Video and Audio Generation	3	Optional
Basic Robotics	6	Optional
Building Energy Certification	3	Optional
Design of Solar and Eolic Systems	6	Optional
Digitalization Applied to Energy Systems	3	Optional
Electric Vehicles	6	Optional
Electrical Project Design with Eplan	3	Optional
Experimental Methods for New and Sustainable Materials	3	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
Introduction to Robotics and Automation	3	Optional
Life Cycle Assessment	3	Optional
Numerical Methods for Engineers	6	Optional
Photonics. Optics Applied to Engineering	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

Subjects	ECTS credits	Type
Bachelor's Thesis	24	Project