@font-face{ font-family:'Glyphicons Halflings'; src:url("/content/assets/fonts/bootstrap/glyphicons-halflings-regular.eot"); src: url("/content/assets/fonts/bootstrap/glyphicons-halflings-regular.eot?#iefix") format("embedded-opentype"), url("/content/assets/fonts/bootstrap/glyphicons-halflings-regular.woff2") format("woff2"), url("/content/assets/fonts/bootstrap/glyphicons-halflings-regular.woff") format("woff"), url("/content/assets/fonts/bootstrap/glyphicons-halflings-regular.ttf") format("truetype"), url("/content/assets/fonts/bootstrap/glyphicons-halflings-regular.svg#glyphicons_halflingsregular") format("svg") }

UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

Bachelor's degree in Mechanical Engineering

TERRASSA SCHOOL OF INDUSTRIAL, AEROSPACE AND AUDIOVISUAL ENGINEERING (ESEIAAT)

The **bachelor's degree in Mechanical Engineering**, provides a solid grounding in the design, development and use of machinery; mechanical processes and systems; criteria for the selection of materials; and the structural design of production systems and processes. You will acquire the knowledge needed to analyse, calculate, design and test machines, industrial installations, hydraulic and thermal engines, industrial structures and constructions, and production systems. You will also receive multidisciplinary training in fluid mechanics, thermal technology, electricity, automation, the design and construction of industrial HVAC systems, and graphic engineering techniques.

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

Admission mark 2025-2026 academic year
9,085

Language of instruction

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

Information on language use in the classroom and students' language rights.

Fees and grants
Approximate fees per academic year: €1,061 (€1,800 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

Pre-enrolment code
31015

Places via a change of degree
1

Admission mark 2025-2026 academic year

9,085. Admission mark

Weighting. University entrance examinations (PAU)

Weighting. University entrance examinations (PAU)

Registration and enrolment

What are the requirements to enrol in a bachelor's degree course?

CFGS credit transfer

Consult the university studies search engine of the Universities Channel of the Generalitat de Catalunya

Legalisation of foreign documents

All documents issued in non-EU countries must be legalised and bear the corresponding apostille.

CURRICULUM

Subjects	ECTS credits	Type
FIRST SEMESTER		
Chemistry	6	Compulsory
Engineering Presentation	6	Compulsory
Environmental Technologies and Sustainability	6	Compulsory
Mathematical Methods I	6	Compulsory
Physics I	6	Compulsory
SECOND SEMESTER		
Economics and Business Administration	6	Compulsory
Fundamentals of Informatics	6	Compulsory
Materials Science and Technology	6	Compulsory
Mathematical Methods II	6	Compulsory
Physics II	6	Compulsory
THIRD SEMESTER		
Electrical Systems	6	Compulsory
Fluid Mechanics	6	Compulsory
Mathematical Methods III	6	Compulsory
Mechanical Systems	6	Compulsory
Operations Management	6	Compulsory
FOURTH SEMESTER		
Elasticity	6	Compulsory
Electronic Systems	6	Compulsory
Industrial Automation and Control	6	Compulsory
Probability and Statistics	6	Compulsory
Thermal Engineering	6	Compulsory
UAV Research and Development	3	Optional
UAV Research and Development Project	3	Optional
FIFTH SEMESTER		

Subjects	ECTS credits	Type
Fluid Engineering	6	Compulsory
Machine and Mechanism Theory and Design I	6	Compulsory
Materials Science and Engineering	6	Compulsory
Strength of Materials	6	Compulsory
Thermal Systems I	4.5	Compulsory
SIXTH SEMESTER		
Engineering Graphics	6	Compulsory
Machine and Mechanism Theory and Design II	6	Compulsory
Structures and Industrial Construction	9	Compulsory
Thermal Systems II	4.5	Compulsory
Academic Writing Skills for Engineering	3	Optional
Advanced Object-Oriented Programming	3	Optional
Autonomous Vehicle Programming	3	Optional
Big Data Tools and Applications	3	Optional
Characterisation Techniques for Metal Alloys	3	Optional
Creative Lab	6	Optional
Creative Programming with Processing	3	Optional
Critical Thinking for 3D Printing	6	Optional
Decision Criteria: the Engineer as Employee or the Engineer as Entrepreneur	3	Optional
Drives and Transmissions	6	Optional
Electromobility and Electrical Aircraft Systems	3	Optional
Embedded System Programming	3	Optional
Energy Efficiency Systems	3	Optional
Energy Storage and Conversion	3	Optional
Engines and Powertrains	3	Optional
Experimental Design	3	Optional
Finite Elements in Structural Analysis	3	Optional
Fundamentals of Robotics	3	Optional
Generative UAV Design	6	Optional
Highly Automated Production Systems	3	Optional
Hospital Engineering	6	Optional
Information and Communication Technologies	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 Practice for Technical Dispute Resolution	3	Optional
Introduction to Object-Oriented Programming	3	Optional
Introduction to Reverse Engineering	3	Optional

Subjects	ECTS credits	Type
Leadership and Professional Development in Engineering	3	Optional
Lightweight Materials for Engineering Applications	3	Optional
Mathematical Models in Engineering	3	Optional
Mathematics and Informatics Engineering	3	Optional
Mobile Programming	6	Optional
Motorbikes. Design and Secrets	3	Optional
Plastic Materials Technology	6	Optional
Professional Communication for Engineers Through Virtual Reality	3	Optional
Real-Time Programming and Databases	3	Optional
Robotics and Automation	3	Optional
Robotics Safety and Automation for Industry 4.0	3	Optional
Surface Chemistry for Industrial Application Design	3	Optional
Sustainability in the Built Environment	3	Optional
Technology, Society and Globalisation. the Sustainability Challenge in the 21st Century	6	Optional
Validating and Communicating Innovative Ideas	6	Optional
Vehicle Dynamics	3	Optional
Vibroacoustics	3	Optional
Web Applications	3	Optional
SEVENTH SEMESTER		
Manufacturing Process Engineering	6	Compulsory
Project Methodology and Orientation	6	Compulsory
Adjustments and Numerical Control	6	Optional
Android Mobile Programming	6	Optional
Complementary Programming	6	Optional
Experimental Mechanics of Advanced Materials and Structures	6	Optional
External Placement	12	Optional
Industrialisation of Mechanical Projects	6	Optional
Introduction to Industrial Paper and Graphics Technologies	6	Optional
Machine and Mechanism Project	6	Optional
Modelling, Complexity and Sustainability	6	Optional
Planning, Simulation and Supervision of Industrial Processes	6	Optional
EIGHTH SEMESTER		
Agrivoltaics: Photovoltaic Solar Energy for Sustainable Development	3	Optional
Air Conditioning Systems and Instrumentation	6	Optional
Air Navigation, Cartography, and Cosmography	3	Optional
Application of Python/Matlab/C++ to Thermal, Mechanical and Aeronautical Engineering Problems	3	Optional
Applied Research Methods in Engineering Science	3	Optional
Artificial Intelligence for UAV Video Object Recognition	3	Optional

Subjects	ECTS credits	Type
Artificial Intelligence for Video and Audio Generation	3	Optional
Basic Robotics	6	Optional
Building Energy Certification	3	Optional
Complex Systems in Engineering	3	Optional
Digitalisation for Energy Systems	3	Optional
Electrical Project Design with Eplan	3	Optional
Finite Element Methods for Engineering	6	Optional
Fundamentals of Rams Engineering in Aerospace Product Certification	3	Optional
Hydraulic Hybrid Machines	3	Optional
Introduction to Robotics and Automation	3	Optional
Introduction to UAV Flight	3	Optional
Life Cycle Assessment	3	Optional
Mechanical CAD	6	Optional
Photography for Science and Technology	3	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
Structural Analysis of Cubesats: Will IT Withstand Launch Conditions?	3	Optional
Technological Projects I	6	Optional
Technological Projects II	6	Optional
The Future of Hydrogen: Technologies and Applications	3	Optional
Thermal Analysis Techniques for Engineering Materials	3	Optional
Bachelor's Thesis	24	Project

PROFESSIONAL OPPORTUNITIES

Regulated profession

- Technical industrial engineer.
- Industrial engineer (after obtaining the master's degree in Industrial Engineering).

Professional opportunities

- Planning, management, execution and assessment of engineering projects related to mechanical engineering.
- Management, design, assembly and maintenance of industrial and production systems and installations in the fields of mechanical, electromechanical and thermal engineering and fluid mechanics.
- Calculation and design of hydraulic and thermal engines.
- Projects in the industrial HVAC sector and the processing and transport of fluids.
- Design, management and maintenance of equipment and industrial installations, structures and constructions.
- Drafting of technical, advisory and feasibility reports.

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 Mechanical Engineering / Bachelor's degree in Textile Technology and Design Engineering
- Bachelor’s degree in Mechanical Engineering / Bachelor's degree in Industrial Design and Product Development Engineering
- Bachelor’s degree in Mechanical Engineering / Bachelor's degree in Industrial Electronics and Automatic Control Engineering
- Bachelor’s degree in Mechanical Engineering / Bachelor’s degree in Chemical Engineering
- Bachelor’s degree in Mechanical Engineering / Bachelor’s degree in Electrical Engineering

With other universities or centers of higher education in Catalonia

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

QUALITY ACCREDITATION

Check the degree’s main quality indicators in the University Studies in Catalonia portal of the Catalan University Quality Assurance Agency. Find information on topics such as degree evaluation results, student satisfaction and graduate employment data.
Further information

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

This bachelor’s degree is also taught at

- Barcelona · EEBE · Show degree
- Manresa · EPSEM · Show degree
- Vilanova i la Geltrú · EPSEVG · Show degree