UNIVERSITAT POLITÈCNICA
DE CATALUNYA
UPC
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 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 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).

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.

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
FIRST SEMESTER		
Chemistry	6	Compulsory

Subjects	ECTS credits	Type
Environmental Technologies and Sustainability	6	Compulsory
Graphic Expression in Engineering	6	Compulsory
Mathematical Methods I	6	Compulsory
Physics I	6	Compulsory
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		
Elasticity	6	Compulsory
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		
Fluid Engineering	6	Compulsory
Science and Engineering of Materials	6	Compulsory
Strength of Materials	6	Compulsory
Theory and Design of Machines and Mechanisms I	6	Compulsory
Thermal Systems I	4.5	Compulsory
SIXTH SEMESTER		
Advanced Programming Oriented Towards Goals	3	Optional
Autonomous Vehicle Programming	3	Optional
Big Data Tools and Applications	3	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
Drives and Transmissions	6	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
Engineering Graphics	6	Compulsory
Engines and Powertrains	3	Optional
Experimental Design	3	Optional
Finite Elements in Structural Analysis	3	Optional
Fundamentals of Robotics	3	Optional
Greening the Built Environment	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
Motorbikes Design and Secrets	3	Optional
Plastic Materials Technology	6	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
Structures and Industrial Construction	9	Compulsory
Surface Chemistry for Industrial Applications Design	3	Optional
Technology, Society and Globalization: the Sustainability Challenge in the XXIth Century	6	Optional
Theory and Design of Machines and Mechanisms II	6	Compulsory
Thermal Systems II	4.5	Compulsory
Uav Generative Design	6	Optional

Subjects	ECTS credits	Type
Validating and Communicating Innovative Ideas	6	Optional
Vehicle Dynamics	3	Optional
Vibroacoustics	3	Optional
Web Applications	3	Optional
Written Academic Skills for Engineering	3	Optional
SEVENTH SEMESTER		
Adjustments and Numerical Control	6	Optional
Advanced Programming	6	Optional
Engineering of Manufacturing Processes	6	Compulsory
Experimental Mechanics of Advanced Materials and Structures	6	Optional
Industrialization of Mechanical Projects	6	Optional
Initiation to Paper and Graphic Industrial Tecnologies	6	Optional
Internship	12	Optional
Modelisation, Complexity and Sustainability	6	Optional
Planning, Simulation and Supervision of Industrial Processes	6	Optional
Programming of Mobiles Android	6	Optional
Project of Machines and Mechanisms	6	Optional
Project Oriented Methodology	6	Compulsory
EIGHTH SEMESTER		
Agrivoltaics: Photovoltaic Solar Energy for Sustainable Development	3	Optional
Air Conditioning Systems and Instrumentation	6	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
Building Energy Certification	3	Optional
Digitalization Applied to Energy Systems	3	Optional
Electrical Project Design with Eplan	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
Mechanical CAD	6	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

Subjects	ECTS credits	Type
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