

# 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.

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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](#).

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### DOUBLE-DEGREE AGREEMENTS

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#### Double-degree pathways at a single school

- 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

## PROFESSIONAL OPPORTUNITIES

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

<b>Subjects</b>	<b>ECTS credits</b>	<b>Type</b>
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>		
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
<b>FIFTH SEMESTER</b>		
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
<b>SIXTH SEMESTER</b>		
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
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

<b>Subjects</b>	<b>ECTS credits</b>	<b>Type</b>
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
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
<b>SEVENTH SEMESTER</b>		
Adjustments and Numerical Control	6	Optional
Advanced Programming	6	Optional
Engineering of Manufacturing Processes	6	Compulsory

<b>Subjects</b>	<b>ECTS credits</b>	<b>Type</b>
Experimental Mechanics of Advanced Materials and Structures	6	Optional
Industrialization of Mechanical Projects	6	Optional
Initiation to Paper and Graphic Industrial Technologies	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
<b>EIGHTH SEMESTER</b>		
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
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