

# 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	Туре
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           SECOND SEMESTER         Compulsory           Economics and Business Administration         6         Compulsory           Foundations of Computing         6         Compulsory           Materials Science and Technology         6         Compulsory           Materials Science and Technology         6         Compulsory           Mathematical Methods II         6         Compulsory           Plusid Mechanics         6         Compulsory           Blectric Systems         6         Compulsory           Mushematical Methods III         6         Compulsory           Potoration Systems         6         Compulsory           Electrichic Systems         6         Compulsory <t< th=""><th>Subjects</th><th>ECTS credits</th><th>Туре</th></t<>	Subjects	ECTS credits	Туре
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Critical Thinking for 3D Printing 6 Optional	Creative Programming with Processing	3	Optional
	Critical Thinking for 3D Printing	6	Optional

Subjects	ECTS credits	Туре
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

Validating and Communicating Innovative Ideas         6         Optional           Vehicle Opnamics         3         Optional           Vibroacoustics         3         Optional           Web Applications         3         Optional           Written Academic Skills for Engineering         3         Optional           SEVENTH SEMESTER           Advanced Programming         6         Optional           Engineering of Manufacturing Processes         6         Optional           Engineering of Manufacturing Processes         6         Optional           Engineering of Manufacturing Processes         6         Optional           Industrialization of Mechanical Projects         6         Optional           Industrialization of Separation (and Separation)         6         Optional           Industrialization of Separation (and Separation)         6         Optional           Industrialization of Separation (and Separation)         6         Optional           Industrialization of Manufacturing Projects of Industrial Projects (and Separation)         6         Optional           Project of Machines and Mechanisms         6         Optional           Project of Machines and Mechanisms         6         Optional           Project of Machines and Mechanisms	Subjects	ECTS credits	Туре
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Web Applications Written Academic Skills for Engineering SEVENTH SEMESTER Adjustments and Numerical Control Advanced Programming Engineering of Manufacturing Processes Engineering of Manufacturing Processes Engineering of Manufacturing Processes Experimental Mechanics of Advanced Materials and Structures Experimental Mechanics Projects Enditiation to Paper and Graphic Industrial Tecnologies Internship Experimental Mechanics Experimental Mechanics Experimental Sustainability Experimental Sustainability Experimental Sustainability Experimental Experim	Vehicle Dynamics	3	Optional
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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           Project of Machines and Mechanisms         6         Optional           Project Oriented Methodology         6         Compulsory           EIGHTH SEMESTER         Agrivoltaics: Photovitaic 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           Building Energy Certification         3         Optional           Building Energy Certification         3         Optional           Bicetrical Project Design with Eplan         3         Optional           Fluoridamentals of Rams Engineering in the Certification of Aerospace Products         3         Optional           Hydrogen's Future: Technologies and Applications         3	Engineering of Manufacturing Processes	6	Compulsory
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	Professional Communication for Engineers Through Virtual Reality II	3	Optional
Sports Engineering 3 Optional	R&D in Engineering	3	Optional
	Sports Engineering	3	Optional

Subjects	ECTS credits	Туре
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

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