

# Bachelor's degree in Materials Engineering

The scientific and technical training you will receive on this **bachelor's degree in Materials Engineering** course will equip you to design, develop, implement, manage and improve the production, transformation, processing, control, recycling and storage of materials and the safety and integrity of metal, ceramic, polymer, composite or biological materials and components. Your multidisciplinary training in this strategic field of engineering will be strongly rooted in materials science and industrial technology. It will cover sectors such as energy (including sustainable energy); automotive and aeronautical engineering; the naval industry; bioengineering; metals, plastics, ceramics and glass; manufacturing technologies; and recycling and environmental impact.

# **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

Barcelona East School of Engineering (EEBE)

# **Official degree**

Recorded in the Ministry of Education's degree register

#### ADMISSION

# Places

40

# **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 Materials Engineering + Bachelor's degree in Mechanical Engineering

# **PROFESSIONAL OPPORTUNITIES**

#### **Professional opportunities**

- Design, assessment, selection and manufacture of materials according to their applications.
- Design, development and control of the manufacture, transformation, reuse and storage of materials.
- Assessment of the safety, durability and structural integrity of materials and components.
- Technical supervision.
- Production engineering.
- Production of electrical components. Employment in the microelectronics industry.
- Selection of materials for design.
- Modelling of production processes and material processing.
- Control of materials and processes, and characterisation in laboratories.
- Quality control of raw materials, processes and products.
- 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

Barcelona East School of Engineering (EEBE)

# CURRICULUM

Subjects	ECTS credits	Туре
FIRST SEMESTER		
Calculus	6	Compulsory
Chemistry	6	Compulsory
Graphic Expression	6	Compulsory
Informatics	6	Compulsory
Physics I: Fundamentals of Mechanics	6	Compulsory
SECOND SEMESTER		
Algebra and Multivariable Calculus	6	Compulsory
Materials Structure and Characterization	6	Compulsory
Numerical Calculus. Differential Equations	6	Compulsory
Physics II: Fundamentals of Electromagnetism	6	Compulsory
Thermodynamics	6	Compulsory

Subjects	ECTS credits	Туре
THIRD SEMESTER		
Electrical Systems	6	Compulsory
Fundamentals of Polymers	6	Compulsory
Mechanical Systems	6	Compulsory
Physical Metallurgy	6	Compulsory
Statistics	6	Compulsory
FOURTH SEMESTER		
Business	6	Compulsory
Electronic Systems	6	Compulsory
Fluid Mechanics	6	Compulsory
Industrial Control and Automation	6	Compulsory
Mechanical Propieties of Materials	6	Compulsory
FIFTH SEMESTER		
Ceramic Materials	6	Compulsory
Electrical and Magnetic Properties of Materials	6	Compulsory
Metallic Materials	6	Compulsory
Numerical Methods	6	Compulsory
Plastic and Composites	6	Compulsory
SIXTH SEMESTER		
Materials Technolgy	6	Compulsory
Mechanical Behaviour	6	Compulsory
Optical, Thermal and Acoustic Properties of Materials	6	Compulsory
Recycling and Raw Materials	6	Compulsory
Wear, Corrosion and Degradation	6	Compulsory
SEVENTH SEMESTER		
Academic and Professional Communication for the Engineering	6	Optional
Additive Manufacturing 1	3	Optional
Additive Manufacturing 2	3	Optional
Advanced Computer-Aided Design	6	Optional
Advanced Simulation of Materials for Engineering and Bioengineering	6	Optional
Advanced Statistics and Applications in Engineering	6	Optional
Applied Photonics	6	Optional
Artificial Intelligence for Engineering	6	Optional
Biochemistry	6	Optional
Building Technology and Industrial Facilities	6	Optional
Climate Change: Science, Energy, Economics, Politics and the Future	3	Optional
Communication in Technical English	9	Optional
Computational Engineering	6	Optional

Subjects	ECTS credits	Туре
Computational Fluid Mechanics and Heat Transfer	6	Optional
Data Engineering and a Business Analytics	6	Optional
Design Validation	6	Optional
Digital Microelectronic Design	6	Optional
Facilities Projects	6	Optional
Fire Engineering	6	Optional
Fundamentals of Functional Materials	6	Optional
Implementation of Automatic Control System	6	Optional
Industrial Equipments and Installations	6	Optional
Innovation Management	6	Optional
Leadership and Management	6	Optional
Manufacturing Technology	6	Optional
Mobile Devices Programming	6	Optional
Natural Materials and Biomaterials	6	Compulsory
Numerical Simulation Applied to Engineering	6	Optional
Physical Chemistry	6	Optional
Production Organisation	6	Compulsory
Professional Skills for the Engineering	6	Optional
Programming for Engineers	6	Optional
Project Development I	6	Optional
Project Development II	6	Optional
Project Engineering & Management	6	Optional
Projects in Materials Engineering	6	Compulsory
Resources Recovery and Circular Economy	6	Optional
Selection and Ecodesign	6	Compulsory
Surface Technology	6	Compulsory
Technology and Sciences in Ancient Times: Egypt and Mesopotamia	6	Optional
Transport Phenomena	6	Optional
EIGHTH SEMESTER		
Bachelor's Thesis	12	Project

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