

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 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

With universities around the world

- Bachelor's degree in Materials Engineering (GEM) + Master's degree in Materials Science and Advanced Materials + *Diplôme Ingénieur de l'EEIGM* (École d'Ingénieurs Européenne en Génie de Matériaux (EEIGM), Université de Lorraine, Lunéville, France)

- Bachelor's degree in Materials Engineering + Master's degree in Materials Science and Advanced Materials + *Diplôme Ingénieur* (École Centrale Lille, École Centrale de Lyon, École Centrale de Marseille, École Centrale de Nantes, CentraleSupélec, Groupe des Écoles Centrales (GEC), France)
- Bachelor's degree in Materials Engineering + Master in Interdisciplinary and Innovative Engineering + *Diplôme Ingénieur* (École Centrale Lille, École Centrale de Lyon, École Centrale de Marseille, École Centrale de Nantes, CentraleSupélec, Groupe des Écoles Centrales (GEC), France)
- Bachelor's degree in Materials Engineering + Master in Chemical Engineering + *Diplôme Ingénieur* (École Centrale Lille, École Centrale de Lyon, École Centrale de Marseille, École Centrale de Nantes, CentraleSupélec, Groupe des Écoles Centrales (GEC), France)

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	Type
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

Subjects	ECTS credits	Type
Physics II: Fundamentals of Electromagnetism	6	Compulsory
Thermodynamics	6	Compulsory
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 Properties 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 Technology	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		
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
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	Type
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
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