Bachelor's degree in Electrical Engineering
Barcelona East School of Engineering (EEBE)

The bachelor's degree in Electrical Engineering covers the technological fundamentals of the generation and distribution of electrical energy and the control and protection of electrical systems. You will acquire the skills needed to supervise and manage engineering projects related to electrical systems, high-, medium- and low-power installations, machine and industrial production line automation, and the generation and distribution of electrical energy. You will also become familiar with emerging fields such as electric traction and the development of renewable energies.

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 (€2,253 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
80

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 Electrical 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 Electrical 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 Electrical 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

- Supervision and management of engineering projects related to the design, analysis, construction, verification and maintenance of systems and equipment for generating, transporting and distributing electrical energy.
- Analysis, design, testing and control of domestic and industrial electrical installations.
- Management of electrical power systems, installations and drives.
- Design, installation and maintenance of electromechanics, automation and industrial production lines.
- Energy and environmental management.
- Energy generation in wind and photovoltaic power systems.
- Drafting of technical, advisory and feasibility reports.
- Management, organisation, planning and quality control.
- 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)

This bachelor’s degree is also taught at
- Terrassa · ESEIAAT · Show degree
- Vilanova i la Geltrú · EPSEVG · Show degree

CURRICULUM

<table>
<thead>
<tr>
<th>Subjects</th>
<th>ECTS credits</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FIRST SEMESTER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calculus</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Chemistry</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Graphic Expression</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Informatics</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Physics I: Fundamentals of Mechanics</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td><strong>SECOND SEMESTER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Algebra and Multivariable Calculus</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Subjects</td>
<td>ECTS credits</td>
<td>Type</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>--------------</td>
<td>------------</td>
</tr>
<tr>
<td>Environmental Technologies and Sustainability</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Materials Science and Technology</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Numerical Calculus. Differential Equations</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Physics II: Fundamentals of Electromagnetism</td>
<td>6</td>
<td>Compulsory</td>
</tr>
</tbody>
</table>

**THIRD SEMESTER**

<table>
<thead>
<tr>
<th>Subjects</th>
<th>ECTS credits</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Systems</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Fluid Mechanics</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Industrial Control and Automation</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Mechanical Systems</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Statistics</td>
<td>6</td>
<td>Compulsory</td>
</tr>
</tbody>
</table>

**FOURTH SEMESTER**

<table>
<thead>
<tr>
<th>Subjects</th>
<th>ECTS credits</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Circuits and Signals</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Electrical Machines I</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Electronic Systems</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Thermodynamics and Heat Transfer</td>
<td>6</td>
<td>Compulsory</td>
</tr>
</tbody>
</table>

**FIFTH SEMESTER**

<table>
<thead>
<tr>
<th>Subjects</th>
<th>ECTS credits</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Machines II</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Engineering Design</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Hydraulic and Thermal Power Plants</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Low and High Voltage Electrical Installations I</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Power Electronics</td>
<td>6</td>
<td>Compulsory</td>
</tr>
</tbody>
</table>

**SIXTH SEMESTER**

<table>
<thead>
<tr>
<th>Subjects</th>
<th>ECTS credits</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Techniques</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Electric Drives</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Electric Power Systems</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Low and High Voltage Electrical Installations II</td>
<td>6</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Power Plants and Renewable Energies</td>
<td>6</td>
<td>Compulsory</td>
</tr>
</tbody>
</table>

**SEVENTH SEMESTER**

<table>
<thead>
<tr>
<th>Subjects</th>
<th>ECTS credits</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additive Manufacturing 1</td>
<td>3</td>
<td>Optional</td>
</tr>
<tr>
<td>Additive Manufacturing 2</td>
<td>3</td>
<td>Optional</td>
</tr>
<tr>
<td>Advanced Computer-Aided Design</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Advanced Control</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Advanced Statistics and Applications in Engineering</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Analysis of Electrical Power Systems</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Applied Photonics</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Artificial Intelligence for Engineering</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Climate Change: Science, Energy, Economics, Politics and the Future</td>
<td>3</td>
<td>Optional</td>
</tr>
<tr>
<td>Subjects</td>
<td>ECTS credits</td>
<td>Type</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>--------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Communication in Technical English</td>
<td>9</td>
<td>Optional</td>
</tr>
<tr>
<td>Computational Engineering</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Data Engineering and a Business Analytics</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Design and Implementation of Electronics Prototypes</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Design Validation</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Digital Microelectronic Design</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Electrical Machines Design</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Facilities Projects</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Fire Engineering</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Geometry for Design</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Green Functions and Linear Differential Equations: Diffusive Problems, Static Inverters</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Implementation of Automatic Control System</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Industrial Automation and Communications</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Industrial Equipments and Installations</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Innovation Management</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Integration of Automatic Systems</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Leadership and Management</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Management Skills</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Mobile Devices Programming</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Numerical Simulation Applied to Engineering</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Physical Chemistry</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Production Organisation</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Programming for Engineers</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Project Development I</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Project Development II</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Project Engineering &amp; Management</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Resources Recovery and Circular Economy</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Smart Grids</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Technology and Sciences in Ancient Times: Egypt and Mesopotamia</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Telecommunications and Internet</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Transport Phenomena</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td>Wind Energy Generation</td>
<td>6</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>EIGHTH SEMESTER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor’s Thesis</td>
<td>24</td>
<td>Project</td>
</tr>
</tbody>
</table>

August 2023. **UPC.** Universitat Politècnica de Catalunya · BarcelonaTech