

BACHELOR'S DEGREE IN MECHANICAL ENGINEERING

UPC MANRESA
Manresa School of Engineering



UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH

International Campus of Excellence

BACHELOR'S DEGREE IN MECHANICAL ENGINEERING

Mechanical engineering has been a fundamental part of twentieth-century development. According to the American Society of Mechanical Engineers (ASME), the world's most important contributions in the twentieth century were, in order of importance, the car, the Apollo, energy generation, the mechanisation of agriculture, the aeroplane, the mass production of integrated circuits, air conditioning and cooling, CAD/CAM systems and other CAE technologies, bioengineering, and codes and standards. Mechanical engineering played a role in most of these innovations.

Over the years, mechanical engineers have been a key to industrial development in every country. They can act effectively in all areas of industrial production and at different stages of projects in research and development, preliminary studies, basic engineering, detailed engineering, industrialisation, construction, operation, etc. Those trained in mechanical engineering can successfully intervene in all branches of the production sector and deal with problems and interact with professionals in other fields. The bachelor's degree offers specialisations ranging from machine design, structures and energy to biomechanics. Mechanical engineering is present in many spheres of society and has a high demand for professionals.

25%
of students have worked on their bachelor's thesis at foreign universities

84%
of graduates would study at the same school again*

* Source: Graduate employment survey of Catalan universities by the Catalan University Quality Assurance Agency (AQU Catalunya) 2020.

93%
of graduates of the bachelor's degree in Mechanical Engineering are in work*

* Source: Graduate employment survey of Catalan universities by the Catalan University Quality Assurance Agency (AQU Catalunya) 2020.

What will I learn?

You will acquire skills that will give you career mobility and enable you to successfully undertake work involving writing up and managing projects, managing production, researching and developing technology and designing machines, products and industrial manufacturing processes. You will be able to carry out all of these tasks without limitations in the field of mechanics (design and manufacture of machines and design of industrial structures and thermal fluid installations).

Professional opportunities

The bachelor's degree qualifies you to practise a regulated profession that is in high demand and that offers many professional opportunities in a range of sectors. Graduates of the degree have the professional skills of technical industrial engineers who have specialised in mechanics. They play a crucial role

in industrial development in general and are destined to occupy positions within a hierarchy. The aim of their multidisciplinary training is to produce highly qualified professionals who may practise as freelancers or be employed in multinationals, public and private research centres, public administrations, universities and consultancy firms. The activity of mechanical engineers is focused on the development, construction, assembly and maintenance of industrial facilities; the calculation and design of machines and consumer goods, including CAE programs and prototype manufacture; advanced-language software development using CAM programs in CNC machines; the study and development of research, development and innovation projects; production management and organisation; teaching (in secondary and higher education); the development of research projects in public or private centres and in large companies' R&D departments; and technology transfer.

Work placement

The bachelor's degree in Mechanical Engineering provides work placement that will complement your academic training. You will acquire new skills and professional experience.

Teaching

In the new learning model, students are the most active part and the focus of teaching practice. The new model is based on:

- A good balance between theoretical and practical training.
- Close interaction with professors and one-to-one academic guidance.
- A collaborative, but also demanding, work atmosphere that fosters autonomy, initiative and responsibility.
- Placements in companies in the sector.
- International mobility from the third year onwards.

Curriculum

This information may be subject to change. Up-to-date information is available at upc.edu

240 ECTS

1st year 1st semester

Mathematics I	6
Physics I	6
Informatics	6
Chemistry	6
Environmental Technologies and Sustainability	6

2nd semester

Mathematics II	6
Physics II	6
Graphic Expression	6
Statistics	6
Materials Science and Technology	6

2nd year 1st semester

Mathematics III	6
Business	6
Thermodynamics and Fluid Mechanics	6
Mechanical Systems	6
Electrical Systems	6

2nd semester

Strength of Materials	6
Electronic Systems	6
Industrial Control and Automation	6
Operations Management	6
Mechanics Technology	6

3rd year 1st semester

Mechanics of Deformable Solids	6
Materials Engineering	6
Engineering Graphics	6
Mechanics and Mechanisms Theory	6
Fluid Dynamics Engineering	6

2nd semester

Theory of Structures and Industrial Construction	6
Machine Kinematics and Dynamics	6
Machine Design	6
Thermal Engineering	6
Project Methodology, Management and Orientation	6

4th year 1st semester

Optional subjects*	24
Mechanical Components and Vibrations	6

2nd semester

Optional subject*	6
Bachelor's Thesis	24

* **Optional subjects**
Computer-Aided Manufacturing / Industrial Construction and Architecture / Modelling and Simulation of Dynamic Systems / Quality Management and Quality, Safety, Security and Environment Systems / Business English / Computer-Aided Design / Maintenance Management / Energy Resources / Drilling for Engineering / Selection of Materials

Basic training

Subjects shared with the industrial engineering branch of knowledge

Specific training

BACHELOR'S DEGREE IN MECHANICAL ENGINEERING

At the Manresa School of Engineering you will find:

- teaching staff who are committed to students' learning and well-being,
- cutting-edge research,
- degrees that integrate theoretical and practical education through work on real projects,
- many options to extend your CV, such as international mobility programmes, work placements and a job bank.

This bachelor's degree qualifies you to officially practise as:

- A technical industrial engineer.
- An industrial engineer, by taking the master's degree in Industrial Engineering.



Training the engineers of the future



Further information:

comunicacio.epsem@upc.edu

epsem.upc.edu

manresa.upc.edu

Follow us on:



@upcmanresa



@upcmanresa



@upcmanresa



UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONATECH

Manresa School of Engineering