

An aerial photograph of a volcanic landscape, showing a dark, rocky terrain with patches of green vegetation and a winding road. A large, stylized blue 'V' graphic is overlaid on the left side of the image. The text 'MASTER'S DEGREE IN NATURAL RESOURCE ENGINEERING' is centered in the lower half of the image.

MASTER'S DEGREE IN NATURAL RESOURCE ENGINEERING

UPC MANRESA
Manresa School of Engineering



UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH

MASTER'S DEGREE IN NATURAL RESOURCE ENGINEERING

The main aim of the master's degree in Natural Resource Engineering is to provide advanced scientific and technical training in the field of natural resource use and management that is respectful of the environment. Teaching is grounded in theory and particularly practice and is delivered from a multidisciplinary perspective to train experts in applied research. The master's degree is taught at the Manresa School of Engineering.

The master's degree trains professionals who are able to form part of research and technological innovation teams in the field of natural resource engineering, as researchers in research centres, administration, waste management bodies, the extractive industry, waste treatment equipment companies, environmental engineering firms and teaching institutions. It also allows graduates to pursue careers in fields that require environmental impact studies, environmental advice, occupational safety and organisation and quality control.

Subjects

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

60 ECTS
credits

First semester

Methodological Tools for Research on Natural Resources	5
Geographic Information Systems and Remote Sensing for Natural Resource Use	5
Statistical Data Analysis Techniques and Experimental Design and Planning	5
Industrial Raw Materials of Geological Origin	5
Energy Resources	5
Bioresource Engineering for Waste Treatment	5

Second semester

Water as a Resource	5
Waste Management and Reuse	5
Analytical Methods for Natural Resources and the Environment	5
Advanced Seminar on Natural Resources as Raw Materials	5
Restoration of Spaces Degraded by Mining and Public Works	5
Master's Thesis	15

 Compulsory

 Optional

Admission to the doctoral degree in Natural Resources and Environment

Face-to-face or blended learning delivery

25%
of students are international students

Intended applicants

The master's degree is aimed at graduates in industrial, civil and environmental engineering, as well as graduates of other engineering, technology, environment and science degrees. There are 25 places on the master's degree, 10 face-to-face and 15 blended learning.

Professional opportunities

The master's degree trains professionals who are able to form part of research and technological innovation teams in the field of natural resource engineering, as researchers in research centres, administration, waste management bodies, the extractive industry, waste treatment equipment companies, environmental engineering firms and teaching institutions. It also allows graduates to pursue careers in mining, civil works and other fields that require environmental impact studies, environmental advice, occupational safety and organisation and quality control. Graduates of the master's degree are eligible for admission to the doctoral degree in Natural Resources and Environment, which has a Pathway to Excellence award from the Ministry of Education, Vocational Training and Sports.

Competencies

- Analyse field and laboratory data and design experiments using computer methods.

- Identify analytical techniques for the characterisation of inorganic natural resources and waste in different states, use these techniques and interpret the results.
- Use scientific and technical information to respond efficiently to any demand for the preparation of an analytical method for characterising a material of natural or anthropogenic origin.
- Use geological materials in industrial processes with a high added value.
- Understand remote sensing and satellite imagery interpretation techniques for characterising and managing geological resources in depth.
- Identify pollutant accumulation processes in air, water and soil compartments.
- Identify the presence of metals in mining waste particularly but also in industrial and agricultural waste.
- Design processes for minimising pollution from the exploitation of natural resources.
- Minimise dust, noise and vibration pollution in mining operations using the most advanced techniques.
- Restore spaces degraded by natural resource exploitation using the most current restoration techniques.
- Design natural biotechnological processes for eliminating pollutants in solid, liquid and gaseous media.

Teaching staff

The master's degree's professors are prominent in their field and recognised for their teaching and research (2018 h-index of 31). They are members of research groups distinguished by the Government of Catalonia, such as the Biological Treatment of Gaseous Pollutants and Odours Group (BIOGAP), the Sustainable Mining Research Group and the Exploration of Natural Resources group.

Delivery and languages of instruction

Teaching on the master's degree is face-to-face or blended, depending on the student's choice, and there is a high proportion of international students. Face-to-face teaching is delivered in Catalan and the blended learning format is delivered in Spanish.

Duration

The programme has a credit load of 60 ECTS credits, which is equivalent to one academic year of two semesters. You can also choose a slower track if your professional situation requires it.

Master's thesis

The master's thesis is a research or professional project that is specific to the degree and enables original contributions or applications. If the project has a research component, you will be able to join one of the School's research groups.

MASTER'S DEGREE IN NATURAL RESOURCE ENGINEERING

UPC Manresa is recognised internationally for research that is closely linked to the city's business and industrial fabric. It offers bachelor's, master's and doctoral degrees in engineering fields and stands out for the level of engagement between teaching staff and students.

The Universitat Politècnica de Catalunya - BarcelonaTech (UPC) is a renowned public institution devoted to research and higher education in the fields of engineering, architecture, sciences and technology. It has 50 years of history and over 30,000 students, and is one of the leading technological universities in Europe. It is the best university in Spain in Civil and Structural Engineering, according to the 2025 QS World University Rankings by Subject.



Training the engineers of the future

Further information:

masters.epsem@upc.edu

manresa.upc.edu



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