Master's degree in Geotechnical Engineering

BARCELONA SCHOOL OF CIVIL ENGINEERING (ETSECCPB)

The general objective of the **master's degree in Geotechnical Engineering** (**master's degree website**) is to produce expert professionals in infrastructure construction related to land (building foundations, containment of underground excavations, tunnels, embankments, stone slopes and earth dams, stabilisation of natural and artificial slopes, etc.) within the framework of emerging paradigms associated with climate change, energy transition, sustainable development goals and territorial resilience.

GENERAL DETAILS

Duration and start date

1.5 academic years, 90 ECTS credits. Starting September

Timetable and delivery

Mornings and afternoons. Face-to-face

Fees and grants

Approximate fees for the master's degree, **excluding other costs** (does not include non-teaching academic fees and issuing of the degree certificate):
€1,743 (€4,050 for non-EU residents).
More information about fees and payment options
More information about grants and loans

Language of instruction

Spanish

Information on language use in the classroom and students' language rights.

Location

Barcelona School of Civil Engineering

Official degree

Recorded in the Ministry of Science, Innovation and Universities

ADMISSION

General requirements

Academic requirements for admission to master's degrees

New intake places

30

Pre-enrolment

Pre-enrolment period open.
Expected deadline: 01/07/2026.
How to pre-enrol

Enrolment

How to enrol

Legalisation of foreign documents

All documents issued in non-EU countries must be legalised and bear the corresponding apostille.

CURRICULUM

Subjects	ECTS credits	Type
FIRST SEMESTER		
Geotechnical Design and Construction	5	Compulsory
Geotechnical Infrastructure	5	Compulsory
Hydrogeology	5	Compulsory
Mathematical and Numerical Tools for Geotechnical Engineering Problems	5	Compulsory
Theoretical and Experimental Soil Mechanics	5	Compulsory
Tunnels and Rock Mechanics	5	Compulsory
SECOND SEMESTER		
Applied Soil Mechanics	5	Compulsory
Characterisation and Behaviour of Geomaterials	5	Compulsory
Earthquake Engineering and Geophysics	5	Compulsory
Geology for Engineering	5	Compulsory
Geomechanics of Failures	5	Compulsory
Interaction Between Groundwater and Civil Works	5	Optional
Modelling of Coupled Problems in Geotechnical Engineering	5	Optional
Seismology and Earthquake Risk	5	Optional
Stability of Natural and Artificial Slopes	5	Optional
Unsaturated Soil Mechanics	5	Optional
THIRD SEMESTER		
Information and Communication Techniques	5	Compulsory
Energy and Geotechnics	5	Optional
Space Risk Analysis and Remote Sensing	5	Optional
Master's Thesis	15	Project

PROFESSIONAL OPPORTUNITIES

Professional opportunities

- Management and implementation of reconnaissance and terrain characterisation campaigns that involve the design and construction of geotechnical infrastructure.
- Assessment and reduction of geological and seismic risks.
- Forensic analysis of cases with geotechnical problems.
- Adaptation of geotechnical solutions to climate change by integrating solutions inspired by nature in geotechnical and land use projects for energy purposes.
- Career development in national and international geotechnical laboratories, companies, administrations and consultancies as geotechnical engineers, project managers, consultants and other professional capacities.
- Development of a research career in R&D centres and/or universities.

Competencies

Generic competencies

Generic competencies are the skills that graduates acquire regardless of the specific course or field of study. The generic competencies established by the UPC are capacity for innovation and entrepreneurship, sustainability and social commitment, teamwork, proper use of information resources, knowledge of a foreign language (preferably English) and gender perspective.

Specific competencies

- Implement conventional and non-conventional solutions in the field of geotechnical engineering.
- Lead geotechnical engineering projects.
- Integrate innovation and research in geotechnical engineering as elements of social, territorial and business development, addressing specific aspects that allow them to be promoted and strengthened in the professional field.
- Integrate continuing education in the field of geotechnical engineering as an element of individual and group development in order to face new challenges for socioeconomic and environmental improvement.
- Carry out and present and defend before an examination committee an original, individual piece of work consisting of a study or project in the field of geotechnical engineering that synthesises the competencies acquired, incorporates new developments and contributes new ideas.
- Integrate the values of sustainability and understand the complexity of systems, with the aim of undertaking or promoting actions that restore and maintain the health of ecosystems and improve justice, thereby generating visions of sustainable futures.
- Analyse problems that require making autonomous, informed and reasoned decisions in order to act with social responsibility following ethical values and principles.
- Develop the ability to evaluate inequalities based on sex and gender to design solutions that resolve them.

ACADEMIC ORGANISATION

UPC school

Barcelona School of Civil Engineering (ETSECCPB)

Academic coordinator

Yeudy Felipe Vargas

Academic calendar

General academic calendar for bachelor’s, master’s and doctoral degrees courses

Academic regulations

Academic regulations for master's degree courses at the UPC

MASTER'S DEGREE WEBSITE