

MASTER'S DEGREE IN GEOTECHNICAL ENGINEERING

ESCOLA DE CAMINS

Barcelona School of Civil Engineering



UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH

International Campus of Excellence

MASTER'S DEGREE IN GEOTECHNICAL ENGINEERING

Access to the doctoral degrees
in Geotechnical Engineering and
Earthquake Engineering that have
received Pathway to Excellence awards

On the master's degree in Geotechnical Engineering you will train as a specialist in geotechnical engineering, water resource management and the assessment and prediction of seismic risk. The aim is for graduates to become professionals and academics with a multidisciplinary vocation in the fields of geotechnical engineering, hydrogeology, geophysics and earthquake engineering.

The course responds to a growing demand for experts that is related to an increase in infrastructure construction and non-conventional Geotechnical activities (such as subsoil storage) and interest in the management of water resources and behaviour of soil pollutants. Graduates who have specialised in Earthquake Engineering and Geophysics may also seek employment as specialists in geophysics and earthquake engineering who have the ability to assess, predict and reduce seismic risk.

120
ECTS

Areas of knowledge

Geotechnical Engineering

Groundwater Hydrology

Earthquake Engineering and
Geophysics

Students can take any of the following specialisations: Geotechnical Engineering, Groundwater Hydrology, or Earthquake Engineering and Geophysics, or design their own pathway among the specialisations. Examples of possible pathways are Construction and Geotechnical Engineering, Geotechnics and the Environment, Risk Assessment, and Modelling for Geotechnical Engineering.

66%
international
students

5
teaching and
research laboratories

7
research groups recognised by
the Government of Catalonia

Languages

Face-to-face teaching is in Spanish, although some subjects and support materials may be taught in English.

International recognition

The master's degree is well known internationally and many of its students come from abroad. Its lecturers are active internationally, with visible effects on the academic programme. Every year, distinguished guest lecturers give classes on the master's degree.

Research

Researchers who are in charge of teaching the master's degree, have gained international recognition in the form of distinctions and prizes. Two doctoral programmes that have been awarded Pathway to Excellence awards—the doctoral degree in Geotechnical Engineering and the doctoral degree in Earthquake Engineering and Structural Dynamics—are taught at the Department. They are essential to applied research in the

fields of hydrogeology, geotechnics, geological engineering and earthquake engineering. Advanced optional subjects complement a wide range of courses, from the foundations of the discipline to the application of engineering practices. They allow students to master multidisciplinary content that will be useful to them in their future careers.

Master's thesis

Optional subjects involve a piece of work on a specific topic that has a research component or offers the application of new techniques in the field of geotechnical or earthquake engineering. Technical projects must be of a professional standard and are designed to prepare students for professional practice by encouraging them to plan and perform quality work based on the knowledge and skills acquired throughout the course, incorporating engineering standards, realistic constraints and economic and environmental considerations. In the case of a project with a research component, students are generally

integrated into teams of researchers from the Department that are working on some of the research projects in which lecturers are involved. In some cases, the work can be done abroad as part of an international project or in collaboration with a company.

Specific requirements

The master's degree is aimed at holders of bachelor's degrees or pre-EHEA degrees in engineering, technical engineering, architecture and technical architecture. A good grounding in physics and mathematics is strongly recommended. The professional track of the master's degree also welcomes applications from candidates with degrees in civil engineering, geology, geological engineering, physics and architecture, in addition to students who have successfully completed the International Groundwater Hydrology Course (CIHS).

www.camins.upc.edu/estudis

Which subjects will you choose?

S1: First semester / S2: Second semester /
S3: Third semester / S4: Fourth semester / A: Anual

Common Compulsory Subjects				35	
Continuum Mechanics (Q1)	5	Modelling of Flow and Transport in Porous Media (Q1)	5	Rock Mechanics (Q1)	5
Modelling in Geoengineering (Q1)	5		5	Groundwaves Generation and Propagation (Q2)	5
Geology for Engineering (Q2)	5	Soils Mechanics (Q1)	5		
Specialisation in Geotechnical Engineering		Specialisation in Groundwater Hidrology		Specialisation in Earthquake Engineering	
Compulsory specialisation subjects	25	Compulsory specialisation subjects	25	Compulsory specialisation subjects	25
Advanced Soil Mechanics (Q2)	5	Aquifers Balance and Recharge (Q2)	5	Sismology (Q1)	5
Foundations (Q1)	5	Aquifer Mechanics (Q2)	5	Earthquake Engineering (Q2)	5
Underground Excavations (Q2)	5	Stochastic Methods in Hydrology (Q2)	5	Geophysical Prospection (Q2)	5
Geotechnical Design and Construction (Q3)	5	Modelling of Soil and Groundwater Contamination (Q1)	5	Sismometry (Q3)	5
Geomechanics of Breakage (Q2)	5	Hydrogeochemical Modelling (Q3)	5	Seismic Hazard Assessment (Q3)	5
Optional specialisation subjects	30	Optional specialisation subjects	30	Optional specialisation subjects	30
Master's Thesis (Q4)				30	

Consult the curriculum on the master's degree website: www.camins.upc.edu/estudis

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Acquire
multidisciplinary
training and in-depth
knowledge of
geotechnical and
earthquake engineering
and water resource
management.

You can carry out
the master's thesis on an
innovative and creative
subject in contemporary
geotechnical engineering
problems in one of the
areas of knowledge.



Your talent, leading your future

Further information:

www.camins.upc.edu/estudis
area.academica@upc.edu

www.upc.edu/sri/en/students



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