MASTER'S DEGREE IN NUMERICAL METHODS IN ENGINEERING

ESCOLA DE CAMINS

Barcelona School of Civil Engineering

UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONATECH

International Campus of Excellence

MASTER'S DEGREE IN NUMERICAL METHODS IN ENGINEERING

Today, industry requires accurate and reliable numerical simulations for product and process design and this master's degree responds to this requirement. Students learn to simulate, predict and optimise problems in engineering using computational mechanics.

Because of the cross-disciplinary and global nature of the field, and with the aim of enhancing the international profile of its graduates, this master's degree is taught in English.

The master's degree in Numerical Methods in Engineering provides in-depth multidisciplinary training in the field of numerical methods. The educational objectives include students learning cutting-edge methods and those mostly commonly deployed in professional practice. Students study the finite element method and similar numerical techniques in detail.

Areas of knowledge

120 ECTS

The aim of this master's degree is to provide multidisciplinary training in developing and applying numerical methods in engineering, particularly in the field of computational mechanics. Basic subjects include continuum mechanics, numerical algebra, programming and finite element methods, and application topics are focused on structural mechanics, fluid mechanics and manufacturing processes.

Background

The master's degree is a continuation of the master's degree in Computing and Design in Engineering, the internationally renowned master's degree that began to be taught at the UPC in 1989.

Professional opportunities

Graduates of this master's degree specialise in the theory and applications of computational methods for product and process design. They are equipped to apply the knowledge they have acquired in employment in industry and have the scientific training needed to go on to pursue a doctoral degree.

International recognition

Every year, the master's degree's teaching staff receive national and international prizes and awards for their teaching and research. Several of our lecturers have been awarded Starting Grants and Advanced Grants by the European Research Council (ERC).

Research

The master's degree in Numerical Methods in Engineering has established itself within the framework of research centres recognised for their scientific contributions in this area, such as the International Centre for Numerical Methods in Engineering, which currently employs more than 200 researchers from 28 countries.

Work placement

The curriculum includes in-company work placement, which will enable you to gain professional experience. Work placement can be combined with work on your master's thesis. The aim is to provide students with opportunities to apply the knowledge and skills acquired in computational mechanics within an industrial context.

Master's thesis

Your master's thesis will involve numerical methods and will solve a specific engineering problem or be devoted to a research topic. Choosing a topic of interest to a national or international company or research centre will be looked on favourably, particularly if it helps to solve problems of a practical nature.

Specific requirements

This master's degree is aimed at graduates with a capacity for abstract reasoning who are interested in solving problems. Prior scientific training and a solid grounding in mathematics are required. Ideal candidates are those in possession of bachelor's or pre-EHEA degrees in mathematics, physics or applied sciences.
Graduates of other university degrees may need to take bridging courses. For further information on these requirements, visit the master's degree website:

www.camins.upc.edu/estudis

Which subjects will you choose?

The subjects that make up the curriculum are shared with the Erasmus Mundus Master in Computational Mechanics.

First year

Numerical Methods for PDEs*	5
Finite Elements*	5
Continuum Mechanics*	5
Computational Mechanics Tools*	5
Advanced Fluid Mechanics*	5
Communication Skills 1*	5

Computational Wave Propagation*	5
Programming for Engineering and Science	5
Computational Solid Mechanics*	5
Computational Structural Mechanics and Dynamics*	5
Finite Elements in Fluids*	5
Coupled Problems	5

Second year

Entrepreneurship*	5
Advanced Discretization Methods	5
Communication Skills 2*	5
Industrial Training*	15

Master Thesis*	30

S1　　S2　　S3　　S4　　*Compulsory subjects

MASTER'S DEGREE IN
NUMERICAL METHODS IN ENGINEERING

You will learn cutting-edge methods and those mostly commonly deployed in professional practice.

You can carry out the master's thesis on an innovative and creative subject of the field.

Your talent, leading your future

Further information:
www.camins.upc.edu/estudis
area.academica@upc.edu

www.upc.edu/sri/en/students

The International Centre for Numerical Methods in Engineering provides teaching for this degree.

UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONA**TECH**

Barcelona School of Civil Engineering

UPC

AQU EXCELLENT® Acreditation AQU431392/2016

EUR-ACE®

ASIIN Accredited Degree Programme 2015-2020