UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONATECH

Bachelor's degree in Mathematics

The **bachelor’s degree in Mathematics** is a rigorous course that will provide you with comprehensive training in the core disciplines of mathematics and their applications. If your goal is to do research, you will be well equipped to join leading groups conducting research in mathematics, engineering and technology, natural and health sciences, or the social sciences. You will be able to pursue a career in business or industry, or in banking and finance, consulting, health or services – all sectors in which mathematicians are increasingly valued for their training and ability to learn. If you are interested in teaching, after completing a master’s level teacher-training course, you will be able to teach mathematics at secondary schools.

GENERAL DETAILS

Duration
4 years

Study load
240 ECTS credits (including the bachelor's thesis). One credit is equivalent to a study load of 25-30 hours.

Delivery
Face-to-face

Language of instruction

Check the language of instruction for each subject (and timetable) in the course guide in the curriculum.

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

Fees and grants
Approximate fees per academic year: €1,107 (€2,553 for non-EU residents). Consult the public fees system based on income (grants and payment options).

Location
School of Mathematics and Statistics (FME)

Official degree
Recorded in the Ministry of Education's degree register

ADMISSION

Places
75

Registration and enrolment
What are the requirements to enrol in a bachelor's degree course?

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

DOUBLE-DEGREE AGREEMENTS

With universities around the world

- Bachelor’s degree in Mathematics + Master's degree in Advanced Mathematics and Mathematical Engineering and Ingénieur INP from the École Nationale Supérieure d'Informatique et de Mathématiques Appliquées de Grenoble (ENSIMAG)

Within the framework of the courses offered by the Interdisciplinary Higher Education Centre (CFIS)
You can also take an interdisciplinary double degree coordinated by the CFIS at two UPC schools.
Further information on the CFIS website

PROFESSIONAL OPPORTUNITIES

Professional opportunities

- Strategic consulting, technology consulting, management of projects and educational programmes.
- Business, industry and services: data analysis, programming and software engineering, market research, planning and management, cryptography and security.
- Research in mathematics: teaching and research at universities and research centres.
- Research in other sciences and in engineering and technology: research centres and laboratories in the public and private sector: computing, communications, robotics, mechanics, biology and medicine.
- Banking, finance, insurance: risk analysis and control, portfolio and fund management, investment management, design and evaluation of financial products, cryptography and security.
- Teaching positions with public and private secondary schools, publishers, and companies in the education sector.

ORGANISATION: ACADEMIC CALENDAR AND REGULATIONS

Academic calendar

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

Academic regulations

Academic regulations for bachelor's degree courses at the UPC

Language certification and credit recognition

Queries about language courses and certification

School of Mathematics and Statistics (FME)

CURRICULUM

Subjects	ECTS credits	Type
FIRST SEMESTER		
Computer Science	7.5	Compulsory
Fundamentals of Mathematics	7.5	Compulsory
Linear Algebra	7.5	Compulsory
Single Variable Calculus	7.5	Compulsory
SECOND SEMESTER		
Affine and Euclidean Geometry	7.5	Compulsory
Differential Calculus	7.5	Compulsory
Discrete Mathematics	7.5	Compulsory
Numerical Linear Algebra	7.5	Compulsory
THIRD SEMESTER		
Algorithmics	7.5	Compulsory
Integral Calculus	7.5	Compulsory
Mathematical Programming	7.5	Compulsory
Multilinear Algebra and Geometry	7.5	Compulsory
FOURTH SEMESTER		
Complex Variable Functions	7.5	Compulsory

Subjects	ECTS credits	Type
Physics	7.5	Compulsory
Real Analysis	7.5	Compulsory
Topology	7.5	Compulsory
FIFTH SEMESTER		
Algebraic Structures	7.5	Compulsory
Numerical Calculus	7.5	Compulsory
Ordinary Differential Equations	7.5	Compulsory
Probability Theory	7.5	Compulsory
SIXTH SEMESTER		
Differential Geometry	7.5	Compulsory
Mathematical Models in Physics	7.5	Compulsory
Partial Differential Equations	7.5	Compulsory
Statistics	7.5	Compulsory
SEVENTH SEMESTER		
Abstract Algebra	3	Optional
Algorithmics and Compelxity	6	Optional
Bayesian Methods	6	Optional
Combinatorics and Graph Theory	6	Optional
Cryptology	6	Optional
Data Engineering and Blockchain	3	Optional
Data Science Applied to Finance	3	Optional
Differentiable Manifolds	6	Optional
Dynamical Systems	6	Optional
Ethics in Science and Engineering	6	Optional
Experimental Design	6	Optional
Files and Databases	6	Optional
Galois Theory	6	Optional
Generalised Linear Models	6	Optional
Industrial Statistics	6	Optional
Linear Models	6	Optional
Mathematical Models in Technology	9	Compulsory
Mathematics for Education and Dissemination	6	Optional
Mathematics of Digital Technologies	3	Optional
Numerical Methods for Differential Equations	6	Optional
Statistical Methods for Data Mining	6	Optional
Statistical Methods for Finance and Insurance	6	Optional
Time Series Analysis	6	Optional
EIGHTH SEMESTER		

Subjects	ECTS credits	Type
Algebraic Geometry	6	Optional
Algebraic Topology	6	Optional
Computational Modelling	6	Optional
Control Theory	6	Optional
Demography	6	Optional
Econometrics	6	Optional
Engineering Optimisation	6	Optional
Financial Mathematics	6	Optional
Financial Optimisation	6	Optional
Functional Analysis	6	Optional
History of Mathematics	6	Optional
Multivariate Analysis	6	Optional
Music and Mathematics	3	Optional
Non-Parametric and Resampling Methods	6	Optional
Nonlinear Time Series Analysis	6	Optional
Quantum Computing	6	Optional
Queueing Theory and Simulation	6	Optional
Statistics for Biosciences	6	Optional
Survival Analysis	6	Optional
Bachelor's Thesis	15	Project