

Master's degree in Advanced Building Construction

The **master's degree in Advanced Building Construction** ([master's degree website](#)) produces graduates for the building construction sector, which is increasingly automated. In the current context, which has seen a decrease in the number of new buildings being built in Spain, concepts such as sustainability and energy efficiency are increasingly important, as are the recovery, conservation and improvement of built heritage. The master's degree therefore provides an education that confronts the sector's new challenges and the skills students need to understand and deepen their knowledge of the construction process and pursue a research career.

GENERAL DETAILS

Duration and start date

1.5 academic years, 90 ECTS credits. Starting September

Timetable and delivery

Afternoons. Face-to-face

Fees and grants

Approximate fees for the master's degree, excluding other costs, €2,490 (€6,225 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 Building Construction \(EPSEB\)](#)

Official degree

[Recorded in the Ministry of Education's degree register](#)

ADMISSION

General requirements

[Academic requirements for admission to master's degrees](#)

Specific requirements

Applicants must have one of the following qualifications:

- A pre-EHEA degree or bachelor's degree in an engineering discipline
- A diploma in technical architecture or a bachelor's degree in building engineering
- A diploma in topography or a bachelor's degree in topography or geomatics
- A diploma in public works
- Another degree (depending on prior learning)

Required documents: university degree certificate, academic record and employment record

Admission criteria

- Academic record
- Employment record
- Knowledge of English, Level B1 (optional)
- For non-native speakers of Spanish, must provide proof of having attained Level B2

Places

30

Pre-enrolment

Pre-enrolment period open.

Expected deadline: 04/06/2023.

[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](#).

PROFESSIONAL OPPORTUNITIES

Professional opportunities

Graduates of the master's degree are generally employed as managers or as experts working in the following areas:

- Management of conservation and maintenance of the built heritage
- Project management and supervision
- Energy efficiency and bioclimatic architecture
- Consulting, advisory services and technical auditing
- Drafting and development of technical projects
- Technical management of buildings in the use and maintenance stages
- Building construction production management
- New building construction technologies
- Rehabilitation of existing buildings
- Environmental impact studies and energy auditing
- Public administration
- Teaching and research

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, knowledge of a foreign language (preferably English), teamwork and proper use of information resources.

Specific competencies

- Capacity for innovation: understanding the reasons for and mechanisms of technological and technical change.
- Awareness of the construction materials and techniques in each historical period and ability to appraise their influence in architectural design.
- Knowledge of the principles of thermal, optic and acoustic physics.
- Capacity for modelling physical processes and using numerical methods to solve the resulting models.
- Capacity for describing heat exchange phenomena, thermal perception, air quality in interiors, ventilation, lighting conditions, and noise propagation and control.
- Capacity for designing HVAC installations, lifts, security and surveillance systems, home automation installations, and information and communication networks.
- Capacity for managing installations and their cost and maintenance.
- Capacity for carrying out and managing installation projects.
- Capacity for modelling building structures and evaluating their load-carrying capacity.
- Capacity for evaluating the behaviour of the ground as a function of its characteristics and type of foundation.
- Capacity for designing and dimensioning the reinforcement of structural elements.
- Knowledge of the characteristics of seismic action and the application of prevailing regulations to seismic calculations of building structures.
- Knowledge and application of basic concepts of pre-stressing with post-tensioned reinforcement.

- Capacity for determining the thermal behaviour and energy efficiency of existing buildings.
- Capacity for designing a methodological guide to the assessment, diagnosis and rehabilitation of a building.
- Understanding of the keys to the historical documentation of buildings.
- Capacity for designing rehabilitation interventions with a sufficient historical basis to preserve a building's functional, technical, artistic and historical values.
- Capacity for applying advanced graphic surveying techniques in the assessment of existing buildings.
- Knowledge of material characterisation techniques and ways of solving concrete problems in this area.
- Capacity for analysing and applying the analytical processes studied to solve concrete problems in existing buildings until a final diagnosis is reached.
- Familiarity with evaluation methods based on observed or measured data and the results of numerically supported analytical processes.
- Knowledge of specific techniques for correcting damage to existing buildings and improving them.
- Capacity for applying the knowledge acquired to drafting the corresponding rehabilitation projects.
- Capacity for modelling numerical problems.
- Capacity for implementing models.
- Capacity for making decisions based on results analysis.

ORGANISATION: ACADEMIC CALENDAR AND REGULATIONS

UPC school

[Barcelona School of Building Construction \(EPSEB\)](#)

Academic coordinator

[Jesus Abad Puente](#)

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](#)

CURRICULUM

Subjects	ECTS credits	Type
FIRST SEMESTER		
Advanced Facilities	5	Compulsory
Building Structures	5	Compulsory
Engineering in the Architecture of the 20th and 21st Century	5	Compulsory
Introduction to Renovations of Existing Building	5	Compulsory
Physical Phenomena in Building Construction	5	Compulsory
Prediction Models in Building Construction	5	Compulsory
SECOND SEMESTER		
Added Value Facilities in Smart Cities and Smart Buildings	5	Optional
Building Management Through Building Information Modelling (Bim)	5	Optional
Control and Evolution of Building Fires	5	Optional
Environmental and Architectural Acoustics	5	Optional
New Industrialized Techniques Applied to Building Construction	5	Optional
Reduction, Reutilization and Recycling in Construction	5	Optional

Subjects	ECTS credits	Type
Timber Construction in the 21st Century	5	Optional
THIRD SEMESTER		
Advanced 3D Modeling for Construction Processes	5	Optional
Advanced Materials in Building Construction	5	Optional
Building and Material Technologies of Low Environmental Impact	5	Optional
Energy Efficiency and Renewable Energies	5	Optional
Management and Alternatives to Building Heritage	5	Optional
Urbanism, Sustainable Development and Climate Change	5	Optional
Master's Thesis	20	Project

March 2023. [UPC](#). Universitat Politècnica de Catalunya · BarcelonaTech