

# Master's degree in Structural Analysis of Monuments and Historical Constructions (SAHC)

**Master's degree in Structural Analysis of Monuments and Historical Constructions (SAHC)** ([master's degree website](#)), coordinated by the **Universidade do Minho** and with the **UPC as a participant**, provides advanced engineering training in the conservation of historical architectural structures. The course is taught by experts in the fields of architecture, engineering, geophysics, chemistry and history and aims to provide a multidisciplinary understanding of the field of structural conservation.

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## GENERAL DETAILS

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### Duration and start date

One academic year, 60 ECTS credits. Starting September

### Timetable and delivery

Mornings and afternoons. Face-to-face

### Language of instruction

English

Information on [language use in the classroom and students' language rights](#).

### Location

- Universidade do Minho (Portugal)
- Czech Technical University in Prague (Czech Republic)

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## ADMISSION

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### General requirements

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

### Places

25

### Pre-enrolment

To enrol for an interuniversity master's degree coordinated by a university other than the UPC, you must enrol through the coordinating university:

[Universidade do Minho \(Portugal\)](#)

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## PROFESSIONAL OPPORTUNITIES

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### Professional opportunities

Europe is a world leader in knowledge generation, methodology and technology applicable to the conservation and restoration of architectural heritage. Substantial investment in recent years has led to significant advances in experimental and numerical techniques applied to the conservation of architectural heritage structures. The course will provide education and new prospects to engineers and architects who are seeking to acquire experience and develop their careers in the study, conservation and restoration of existing constructions, with a focus on architectural heritage and monuments.

This master's degree is of interest to graduates with Engineering and Architecture degrees who wish to work as consultants, designers or contractors in the conservation and restoration of structures that constitute architectural heritage, or who wish to supervise the conservation of local, international or global architectural heritage within the framework of private or public institutions, including governments.

## 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

(PT, professional track; RT: research track)

On completing this master's degree, students will be able to:

- Show knowledge of current criteria and methodologies for the restoration of monuments (PT, RT).
- Design, plan and execute studies of architectural heritage, including the phases of preliminary research, inspection, diagnosis and intervention (RT).
- Come up with, design and implement solutions for the conservation and restoration of monuments and historical structures (PT).
- Use the technologies and procedures available at the current level of knowledge for the inspection and the material, constructional, morphological, mechanical and structural characterisation of historical structures. Specifically, graduates will have knowledge of advanced experimental and computational analysis techniques (RT).
- Research the historical and cultural aspects and contexts of monuments and solve problems relating to different historical construction phases or in new or unfamiliar social, cultural or economic contexts (PT).
- Solve problems and cope with technical and scientific challenges in a structured and rigorous fashion through the application of advanced theoretical and analytical tools (RT).
- Develop the engineering process in relation to the decision-making process concerning actions involving architectural heritage (PT).
- Work in interdisciplinary teams (consisting of historians, archaeologists, architects, physicists, geophysicists, chemists and others) using shared knowledge and vocabulary (PT, RT).
- Develop criteria and technologies that contribute to conceptual, methodological and technological progress in the analysis, conservation and restoration of structures that are important as architectural heritage (RT).

### Other cross-disciplinary competencies

On completing this master's degree, students will be able to:

- Exchange ideas and knowledge through active integration into and participation in specialised or interdisciplinary networks.
- Know and apply advanced calculation, simulation and design tools (RT).
- Analyse, synthesise and integrate knowledge, approach complex problems and make judgements based on incomplete or limited information (PT, RT).
- Include the necessary reflections on the social and ethical responsibilities of the application of knowledge and judgements in studies and in practical applications (PT).
- Come up with, improve or innovate solutions or products creatively and generate new ideas relating to the theory, methodology and techniques of restoration (RT).
- Adopt a proactive attitude to changes and improvements in the context of economic development and international competitiveness (PT).
- Learn continually and independently through access to sources of information and training and through the critical analysis of personal findings or the findings of others (PT, RT).
- Collect and organise relevant information and critically examine the results of personal work or the work of others (PT, RT).
- Communicate the results of projects rationally, clearly and effectively to expert and non-expert audiences (PT, RT).
- Develop new sensitivities in terms of cultural, social and environmental aspects (PT, RT).

- Show an ethical commitment to the principles of conservation and restoration of cultural heritage and to the improvement of the living conditions of human beings and to sustainable development (PT, RT).
- Carry out research into theoretical aspects (conceptual and methodological) of technology applicable to the conservation and restoration of architectural heritage and generate original ideas or develop new applications (RT).
- Show a firm grasp of terminology and the ability to express ideas in the field of the master's course, in English (PT, RT).

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## ORGANISATION: ACADEMIC CALENDAR AND REGULATIONS

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### UPC school

[Barcelona School of Civil Engineering \(ETSECCPB\)](#)

### Participating institutions

[Universitat Politècnica de Catalunya \(UPC\)](#)

[Czech Technical University in Prague \(Czech Republic\)](#)

[Universidade do Minho \(Portugal\) - \*\*coordinating\*\* university](#)

[Università degli Studi di Padova \(Italy\)](#)

### Academic coordinator

[Pere Roca Fabregat](#)

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## CURRICULUM

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