PhD School - Politecnico di Milano

Regulations of the PhD Programme in:

Preservation of the Architectural Heritage

Cycle XXXVI
1. General Information

PhD School - Politecnico di Milano

PhD Programme: **Preservation of the Architectural Heritage**

Course start: November 2020

Location of the PhD Programme: Milano Leonardo

Promoter Department: **Department of Architecture and Urban Studies** (DAStU)

Scientific Disciplinary Sectors
- ICAR/19 Conservation and Restoration of Architecture
- ICAR/18 History of Architecture
- ICAR/09 Structural Engineering
- ICAR/08 Structural Mechanics
- ICAR/12 Architectural Technology
- ICAR/22 Real Estate Appraisal
- CHIM/12 Chemistry for Environment and Cultural Heritage

**ERC Sectors**
- SH5_11 Cultural heritage, cultural memory; SH6_12 Historiography, theory and methods of history;
- SH6_1 Archaeology, archaeometry, landscape archaeology; PE8_3 Civil engineering; PE4_17 Characterization methods of materials; PE4_18 Environment Chemistry

PhD School Website: [http://www.polimi.it/phd](http://www.polimi.it/phd)

2. General presentation

The Doctorate Course in “Preservation of the Architectural Heritage” was first held at Milan-based Politecnico back in 1983.

The PhD program focuses its attention to some currently crucial themes for the preservation, conservation, restoration management and valorization of Architectural Heritage. Starting from the fundamental topics of knowledge, preservation, design and intervention, the PhD program takes care of the most important and urgent problems affecting the built Heritage and Cultural Landscapes: the fragility and the abandonment of historic marginal areas; the climate change and its effects on the built environment; the improper pressure of mass tourism on our historic settlements and sites of cultural interest, the needs for a wider social involvement in the field also through appropriate ICT mediums, the management and the use of architectural Heritage.

The conservation of Architectural Heritage is, in fact, a strategic field as well as one of the main
important resources for worldwide economy and for a sustainable future in different areas of the world. The team of professors, promoting and participating in the debate about these matters on a national and international scale, will thus deal with a broad range of issues requiring strong and real multidisciplinary approach and all the many competences present in the PhD Board but also others outside it, for specific topics.

On the strength of a solid, long-standing research tradition, the themes addressed and the methodologies adopted are meant to update contents and tools, the approach to the modern contemporary themes of cultural heritage protection and enhancement. Therefore, the development of pioneering themes and innovative research processes will be encouraged, such as the investigation of the territorial fragilities, in abandoned settlements, in archaeological sites, in towns and cities damaged by earthquakes or in conflict areas. The Course reflects one of the main research line carried out within the Department of Architecture and Urban Studies, regarded as excellent in research assessment by Italian Ministry of Education, University and Research (MIUR) for the quality of its research programs.

The PhD programme is meant as the place where theorization, methodology, investigation into the most significant chapters of the protection of historic architectural heritage and historic landscapes are connected to complex, challenging operating research themes, on-site and lab experimentation of analytical and diagnostic stages.

The PhD programme, lasting three years, calls for the acquisition of 180 credits overall. Twenty-five credits are acquired through the attendance of courses and the passing of the relative exams, concentrated in the first year of PhD programme.

In particular:
- 15 credits are offered and organized by the PhD programme in Preservation of the Architectural Heritage;
- 10 credits by the PhD School (soft and transferable skills courses).

Further additional credits are aimed at personal study and research for the PhD thesis. The activities undertaken, in particular during the second and third year, also include attendance of workshops, seminars, national and international conferences related to individual research, with great attention to conferences wherein PhD candidates present the results, even partial, of their research theses.

To the aim of their thesis research, PhD candidates have the opportunity to rely on facilities and laboratories, both inside and outside the University. The breadth and width of those provides them with a crucial support to the purpose of acquiring “competence for highly qualified research activities” in the domain of architectural heritage protection, such as advanced methods of investigation; knowledge management and preservation processes.

The PhD course is run by a Coordinator and a Faculty Board. The Coordinator chairs the Faculty Board, coordinates the preparation of the annual Educational Programme and organises the general educational activities of the PhD course (see Attachment A1).

The Faculty Board is responsible for the Educational programme and for teaching and administrative activities related to the PhD course (see Attachment A2).

In addition to the professors of the Politecnico di Milano, the Faculty Board includes representatives from other well-known universities and Research Institutes (Università IUAV, Venezia; Università di Genova; Università Napoli Federico II; Università degli Studi di Bergamo; Istituto di Scienze del
Patrimonio Culturale; ISPC-CNR, Milano); they actively collaborate in the teaching and research activities.

3. Objectives
Aim of PhD course is providing the PhD candidates with a unique training experience in the Italian panorama, so far unparalleled also in domains other than the preservation of the architectural heritage. The program of study leading to the doctoral degree is organized in such a way that the students can get ready to contribute to enhance knowledge in the field of Preservation of the Built Heritage and Cultural Landscapes; to enable to engage in advanced study and research; to integrate their professional education and experience with the larger problems of the research around the field. The multi-disciplinary nature of the doctoral course benefits from the co-operation with other PhD programmes in the Department DASTU, in the Politecnico di Milano and with the universities that collaborate with the PhD programme activities. The tutorial activities will be contributed by professors from prestigious schools of architecture and engineering as well as cultural heritage experts from foremost Italian Institutes. This aspect increases the technical characteristics and makes PhD immediately competitive at the European level. The Faculty Board organization allows to investigate and share extremely relevant topics that describe the broad domain of preservation, a strategic field and, at the same time, one of the chief resources for the future and economy of a Country. The multidisciplinary skills of the Faculty Board coverage a series of themes, which PhD students might take up in their thesis work, not in themselves alone but as transversal topics and issues that can lead to very different research paths that should nevertheless be deeply integrated:

- **Fragile Heritage**
  - Impacts of climate change on architectural heritage and cultural landscapes;
  - Historic centers, fragility and potentiality;
  - *Inner Areas*: census, conservation and re-use of Architectural Heritage; strategic approaches for the preservation; social involvement and Communities engagement in the protection and management of their Heritage
  - Impact of mass tourism on architectural heritage and cultural landscapes; cultural and sustainable tourism policies and practices;
  - Architectural Heritage at risk in seismic or in conflict areas
  - Architectural Heritage and Cultural Landscapes in Countries in transition.

- **Studies on built heritage**
  - Construction techniques and materials: from the 15th to the 20th century;
  - Architecture and methods of construction: languages, technologies, products and sources;
  - Preservation, conservation and re-use of pre-20th century architecture. The question of re-use as possible cause of conflict with the issues of conservation;
  - Protection, conservation and re-use of twentieth-century architecture;
  - Twentieth-century building techniques and methods of restoration;
  - Inventories of cultural heritage, their history and methodologies;
  - Historical systems of heating, lighting, water supply and drainage/waste evacuation in individual buildings and on an urban scale;
  - Wooden and masonry structures (carpentry, floors and ceilings, stone or brick vaults);
- Traditional construction techniques: conservation problems and approach;
- Materials and finishing of historic buildings: characteristics, production techniques and use as identified in technical literature and by material analysis;
- Technical literature on construction: texts and their transmission, treatises, early technical and scientific journals, architectural manuals and journals;
- Building archaeology: practical issues in archaeological research; buildings materials archaeology: history of their use, continuity and discontinuity in the use of traditional building materials; archaeology of modernism.

c. Diagnostics of materials and Structural Issues
- Innovative materials and methods for the conservation of architectural surfaces;
- Protocols for monitoring the state of preservation of building materials;
- Innovative methods for the dynamic monitoring of resisting structures (under the effect of environmental noise or specific stimuli);
- Critical evaluation of empirical construction technologies developed in the pre-scientific age to meet special needs (in particular, resistance to earthquakes);
- Definition of evaluation process and knowledge of the increases “residual capacity” in existing buildings, ensuring the achievement of the preservation objectives.

d. Cultural Heritage and Economic Evaluation
- The economic perspective on Cultural Heritage;
- The notion of Total Economic Value;
- Stated preferences and Revealed preferences methods.
- How to support decisions about preservation, exploitation and re-use of Cultural Heritage.

4. Professional opportunities and job market
Graduates of the PhD programme have often found employment in public sector and conservation institutions at progressively higher levels, as well as in professional practices and in the business world, in specific specialized fields. PhD candidates from abroad find job in their native countries at University or in Cultural Heritage Institutions.
As regards Italy, the relationship with Italian Ministero per i Beni e le attività culturali, MiBAC, has been definitely fruitful, especially when we consider that many among the best PhDs in Preservation of Architectural Heritage have been hired as officers and executives to the above ministry.
Recently (February 2018) twelve PhD in Preservation of the Architectural Heritage won the competition to become public officers in prestigious seats of the Ministry of Cultural Heritage; others work in prestigious international organizations, still others teach and research in the Universities of their Countries (China, Vietnam, for example).

5. Enrolment

5.1 Admission requirements
Italian and International citizens can apply. They are requested to have graduated in accordance with
the pre-existing laws D.M. 3.11.1999 n. 509, or to have a Master of Science degree in accordance with D.M. 3.11.1999 n. 509, or a Master of Science in accordance with D.M. 22.10.2004 n. 270, or similar academic title obtained abroad. These titles must be equivalent for duration and content to the Italian one, with an overall duration of university studies of at least five years. The certified knowledge of the English language is a requirement for admission. Please refer to the PhD School website for details. The admission to the programmes will be established according to the evaluation of the candidates' curricula, motivation letters, and an illustrative report about the development of a possible PhD research, which candidates will send contextually with their application to the admission announcement.

5.2 Admission deadlines and number of vacancies
The number of positions is indicated in the Call for admission to the 36th PhD cycle Programmes: http://www.polimi.it/phd
Scholarships both on general and on specific themes are available, in accordance with what is specified in the call for admission.

6. Contents

6.1 Requirements for the PhD title achievement
The achievement of the PhD title in Preservation of the Architectural Heritage requires a study and research activity of at least three years equivalent of full time study, research and development of PhD thesis.
PhD candidates in Preservation of the Architectural Heritage must earn a minimum of 25 course credits (see paragraph 6.3 below), and to continuously conduct studies and research. At the beginning of the course, the Faculty Board assigns a tutor to each PhD candidate to supervise and assist him/her in the overall training programme.
The tutor shall be a professor belonging to the Faculty Board. The tutor assists the candidates in the choice of courses to be included in the study plan, which is eventually submitted for approval to the Coordinator of the PhD Programme (see also section 6.4 below). The Faculty Board may assign extra course credits to one or more candidates, in case they need to complete their preparation in specific topics, relevant for their research projects. Similarly, it may require the PhD student to modify topics and contents in relation to the research project presented in the phase of admission to the PhD programme.

6.2 Research development
The main aim of all Politecnico di Milano PhD programmes is the development in the candidates of a research-oriented mind-set, with expertise and skills in a specific research topic. To this end, candidates develop problem-solving capabilities in complex contexts, including the capacity of performing deep problem analysis, identifying original solutions, and evaluating their applicability in practical contexts. These skills provide the PhD candidates with major opportunities of development in their research both in the academic field, and in public and private organizations. PhD candidates are requested to develop an original research contribution. The PhD thesis must thus
contribute to increase the knowledge in the candidate's research field. Besides, it has to be coherent with the research topics developed in the Department where the PhD Programme is carried out. The original research results are collected in the PhD thesis, where the candidate's contribution is put in perspective with respect to the research state of the art in the specific research field. The PhD research is developed, during the three years of the program, under the guidance of a supervisor, who supports the candidate in the setting-out and in the everyday activities related to the thesis development. The supervisor is not necessarily a member of the Faculty Board, and may also belong to a different institution. The supervisor can be supported by one or more co-supervisors. Further activities intended to develop the candidate's personal skills and research expertise are encouraged during the PhD path.

Candidates must acquire the capability to present and discuss their work in their research community. Consequently, both the participation to international conferences and the publication of the research results in peer-reviewed journals are encouraged. The PhD programme favors the candidates' research interactions with other groups in their research field, preferably abroad. Research visits of at least three months are strongly encouraged, as through them the candidates may acquire further skills to develop their research work and thesis. The duration of the programme is normally three years.

6.3 Objectives and general framework of the teaching activities

The PhD Programmes and the PhD School activate teaching forms of different kind and credit value, including courses, seminars, project workshops, laboratories. Teaching activities both cover the basic research issues (problems, theories, methods), which represent the founding element of the PhD Programme and clearly identify its cultural position, and deepening in a specialist way some research issues connected with the problems developed in the theses. Lessons are usually held in English, except when indicated otherwise. The PhD programme includes at least one complete path delivered in English language. Structured teaching activities allow to earn ECTS credits. Other activities typically specialized and for which it is difficult to evaluate the learning and its quantification, fall within the scientific activities of which the Faculty Board takes into account in the overall evaluation, but they do not allow to earn ECTS.

The PhD School of Politecnico di Milano proposes a set of courses aiming to train the PhD candidates in soft and transferable skills. The skills and abilities provided by these courses are expected to help candidates across different areas of their careers in order to respond to the rapidly evolving needs of the global economy and society at large. The PhD School courses activated for the 2020-2021 Academic Year are summarized in the following link:
http://www.dottorato.polimi.it/en/during-your-phd/phd-school-courses
At least 10 of the 25 course credits that each candidate is required to earn shall be obtained through soft and transferable skills courses organized by the PhD School.

Characterizing Courses

In the academic year 2020-2021 the three thematic fields (1. Preservation of Heritage at risk, 2. Methods and themes of historical research; construction history, 3. Science and innovation in diagnostics of materials and structures) will be organized around the common topic Vulnerability and Fragility of marginal Cultural Heritages. The courses do not design an independent field in themselves
but will always interact with all the others contributions provided to the students as regard some common issues, topics and case studies.

1. **Preservation of Heritage at risk**

The course, focused this year on the topic of ‘heritage at risk’, is oriented to improve student competences and skills in identifying and correctly interpreting the problems and in proposing the necessary correlated strategies for the safeguarding of the widespread architectural heritage in territories subjected to risks of different nature and in relation with new challenges, such as climate changes, that Cultural Heritage have to face nowadays and in the near future.

The organization of the course includes a preliminary investigation on topics and problems proposed by the teachers and include ex cathedra lectures by national and international experts and an intensive interdisciplinary workshop aimed at provide a common starting ground to all participants coming from very different cultural formation and tradition.

Exam - The exam is based on the discussion and evaluation of the material produced during the course. The PhD students will be called upon to critically expose the results of the common work, highlighting criticalities and possible developments.

2. **Methods and themes of historical research; construction history**

PhD candidates will deal with historical fields and disciplinary tools – not only architectural, but social and cultural - in order to understand the contributions to building, urban site and landscape knowledge. The cultural heritage – both remote and recent – is strictly connected to the context in which it was produced. The materials and their origins, the building techniques and each element of the construction are an essential key for interpreting the built heritage as a historical source. History gives also fundamental tools for the “anamnesis” in order to explain and understand the uses and the transformations of the buildings, their qualities and weakness, their deterioration as an “historical” phenomenon. This point of view is fundamental for those working in preservation of the cultural heritage. The title itself refers to multiple points of view of archaeology of architecture, from the production to the “construction history”, from the material culture to the investigation of buildings, from the circulation of people and knowledge to the diffusion – still not yet sufficiently studied – of books and manuscripts. To investigate these issues will be organized lectures focusing on monographic topics, held by researchers coming from different linguistic areas, which will introduce PhD candidates to case studies referring to multicultural history.

Exam: PhD students are asked to write a short report on a topic related to the contents of the course and agreed with the professors responsible of the course.

3. **Science and innovation in diagnostics of materials and structures; rehabilitation of historical buildings**

The need to preserve the architectural heritage is strictly connected to the need to inspect the structural safety standards while identifying, when deemed necessary, suitable upgrade interventions. Due to the peculiarity of the national territory, today’s Italian regulations prescribe that global safety be also investigated in relation to seismic events, in addition to the static effects deriving from long-term loads. A variety of analysis tools have been developed and codified through time to the purpose of safety verifications, involving different complexity levels. The course provides a critical view of the different procedures. Studies and analysis have to be extended to materials and methods for conservation works on architectural surfaces: cleaning, surface consolidation and water repellents treatments. Decay mechanisms decrease the surface cohesion; both inorganic and organic products
used with the aim to reinforce the surface and near-surface region microstructure, are overviewed. The course also treats problems dealing with the evaluation of effectiveness and harmfulness of conservation works and their performance monitoring.

Exam: The exam is based on the discussion and evaluation of the material produced during the course. The PhD students will be called upon to critically expose the results of the common work, highlighting criticalities and possible developments.

The tables below summarize the candidate's path (as regards coursework activities). At the same time, the programme foresees that the candidates are devoted to research activity in a continuous way for three years starting from the first, following the lead of their supervisors and of the Faculty Board.

**First Year**

<table>
<thead>
<tr>
<th>Courses</th>
<th>Possible details or reference to following tables</th>
<th>Number of credits (min-max)</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>PhD School Courses</td>
<td>2 courses among the ones at table B</td>
<td>each course 5 credits</td>
<td></td>
</tr>
<tr>
<td>Courses characterizing the PhD</td>
<td>3 courses</td>
<td>each course 5 credits</td>
<td></td>
</tr>
</tbody>
</table>

In the first year of the course, the PhD students will be required to carry out a research activity on common themes within one of the characterizing courses or in coordinated activity from the three courses.

**Second and Third year**

In the second and third year, the candidate should be devoted entirely to the research and to the development of the PhD thesis.

During the second year, a period of study abroad in qualified Research Institutions, chosen in relation with the individual research topic, is strongly recommended.

**PhD Course List**

A) The PhD Programme in *Preservation of Architectural Heritage* organises the Characterising Courses listed in table A.

For the admission to the final exam the acquisition of **at least 15 credits** in this list is mandatory.

B) The PhD School organises general and Interdoctoral courses every year. The acquisition of **at least 10 credits** is mandatory among the courses of B type. The list of PhD courses organized by the PhD School is available at the website [http://www.dottorato.polimi.it/en/during-your-phd/phd-school-courses](http://www.dottorato.polimi.it/en/during-your-phd/phd-school-courses)

C) Other PhD courses

A maximum of 5 mandatory credits can be obtained by choosing among courses provided by other PhD programmes at Politecnico di Milano and/or external Institutions (in this case the previous approval of the tutor and the coordinator is mandatory).

**PREPARATORY COURSES**

If the supervisor and the tutor find it useful or necessary that the candidate attends preparatory courses, the Faculty Board of the PhD programme may assign some extra-credits to be acquired to complete the training path. The credits acquired in this way will be considered as additional, in relation
to the mandatory credits to be acquired with the PhD courses.
A specific study path will be organized for each PhD candidate that may also attend courses offered by
the Scuola di Specializzazione in Beni Architettonici e del Paesaggio, SSBAP [Graduate School in
Architectural and Landscape Heritage] in Milan and in Genoa, and, in relation to the various topics of
their thesis or courses, from Master degree programs.

**SPECIALISTIC COURSES, LONG-TRAINING SEMINARS**
The attendance of Specialist Courses, Workshops, Schools and Seminars cycles is strongly encouraged
and (if these seminars, workshops are certified and evaluated) may permit to acquire credits according
the modalities established by the Faculty Board and previous approval of the study plan submitted by
the candidate. These courses and workshops can be inserted in the study plan, even if they are not
evaluated (and therefore not qualified as credits), as optional “additional teaching”.

The scheduled course planning for the academic year 2020-2021 follows. Other courses may be
activated during the year. In this case, the candidates will be promptly informed and will be allowed to
insert these new courses in their study plan.

**Table A: PHD COURSES CHARACTERISING THE PHD PROGRAMME**

<table>
<thead>
<tr>
<th>SSD</th>
<th>Name of the Course</th>
<th>Professor</th>
<th>A.A./Semester</th>
<th>Language</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICAR/19</td>
<td>Preservation of Heritage at risk</td>
<td>Annunziata Maria Oteri Mariacristina Giambruno Paolo Faccio</td>
<td>1st and 2nd</td>
<td>English</td>
<td>5</td>
</tr>
<tr>
<td>ICAR/18</td>
<td>Methods and themes of historical research; construction history</td>
<td>Marica Forni Alberto Grimoldi Vilma Fasoli Giovanni Menna</td>
<td>2nd</td>
<td>English</td>
<td>5</td>
</tr>
<tr>
<td>ICAR/09</td>
<td>Science and innovation in diagnostics of materials and structures</td>
<td>Claudio Chesi Giulio Mirabella Roberti Antonio Sansonetti</td>
<td>2nd</td>
<td>English</td>
<td>5</td>
</tr>
</tbody>
</table>

**Table B SUGGESTED CROSS-SECTORAL COURSES**

<table>
<thead>
<tr>
<th>SSD</th>
<th>Name of the Course</th>
<th>Professor</th>
<th>Semester</th>
<th>Language</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Research Skills</td>
<td>D. Sciuto</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Advanced Interaction Skills for Academic Professional</td>
<td>M. Arnaboldi</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scientific Communication in English</td>
<td>P. Biscari</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ethics in Research</td>
<td>A. Aliverti</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strategic Decision Making</td>
<td>V. Ferretti</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Epistemology of scientific and technological research “Guido Nardi”.Technology of the future: opportunities and risk</td>
<td>S. Chiodo, A. Campioli. A. Zanelli</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Resource Planning and</td>
<td>E. Colombo</td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6.4 Presentation of the study plan
PhD candidates must submit a study plan, which may be revised periodically (approximately every three months), in order to adequately them to possible changes in the course list, or to needs motivated by the development of their PhD career. The study plans must be approved by the PhD programme Coordinator, according to the modalities established by the Faculty Board of the PhD Programme itself.

6.5 Yearly evaluations
Candidates present their work to the Faculty Board at least once a year. In particular, the candidates must pass an annual evaluation in order to be admitted to the following PhD year. In addition to the year-end review, PhD candidates can submit the thesis to the Faculty Board 2 times a year. The third year evaluation establishes the candidate’s admission to the final PhD defense. As a result of each annual evaluation, the candidates who pass the exam receive an evaluation (A/B/C/D) and may proceed with the enrolment at the following year. Candidates who do not pass the exam are qualified either as “Repeating candidate” (Er) or “not able to carry on with the PhD (Ei)”. In the former case (Er), the candidates are allowed to repeat the PhD year at most once. The PhD scholarships – if any – are suspended during the repetition year. In the latter case (Ei) the candidates are excluded from the PhD programme and lose their scholarships – if any. In case the Faculty Board holds appropriate to assign directly an exclusion evaluation (Ei) without a previous repetition year, the request must be properly motivated, and validated by the PhD School. After the final year, candidates who have achieved sufficient results but need more time to conclude their research work and write their theses may obtain the admission to a further year.

6.6 PhD thesis preparation
The main objective of the PhD career is the development of an original research contribute. The PhD thesis is expected to contribute to the advance of the knowledge in the candidate's research field. The PhD study and research work is carried out, full time, during the three years of the PhD course. Stages or study periods in (Italian or International) companies or external Institutions may complete the candidate’s preparation. The resulting theses need to be coherent with the research issues developed in the Department where the PhD programme is developed. The candidate must present an original thesis, discuss its contribution to the state of the art in the research field in the research community. The PhD research is developed following the lead of a supervisor, who supports the candidate in the
setting out and in the everyday activities regarding the thesis development. At the conclusion of the PhD studies, the Faculty Board evaluates the candidates. Candidates who receive a positive evaluation submit their theses to two external reviewers for refereeing. If the evaluation provided by the reviewers is positive (after the revisions required by the external reviewers), the candidates defend their thesis in a final exam, in front of a Committee composed of three members (at least two of which must be external experts).

7. Laboratories, PhD Secretary Services
The Department of Architecture and Urban Studies, provides the PhD students of the Architectural Heritage Preservation Programme with classrooms, at DAStU (PC workstations, desks and wi-fi connection).

Libraries and archives: The PhD candidates can reference publications from the collection “restoration and preservation” available at the DAStU Library: the current DAStU Library originates from gathering the books and reviews coming from the former Library of Architecture and Planning, from the ex Library of Preservation and History and from the collection “Liliana Grassi”.

Scientific laboratories:
- Diagnostics and Investigations on Building Materials Laboratory (DICA);
- LADC Laboratory – Construction Analysis and Diagnostics Laboratory (DAStU);
- TeCMArCh –Techniques for the Conservation and Management of Architectural Heritage (DAStU);
- Interdepartmental Laboratory ‘Climate and Energy for Cultural Heritage’ (CECH);
- Interdepartmental Laboratory Characterization of materials for architecture (MatArch)

In relation to PhD thesis and topics with the agreement of the competent structures, PhD candidates will have access to the following laboratories and libraries:

Università degli Studi in Genoa
Libraries
- Library of the MARS Laboratory – Division of Archaeology of Architecture
- Library Service Centre “Nino Carboneri” of the Faculty of Architecture
- Library of the Institute of History of Material Culture (ISCUM)
Laboratory
- Analytical Methodologies of Restoration and Construction History, MARSC, in the Specialization School of Architectural and Landscape Heritage

Università IUAV in Venice
Libraries
- Library of the History of Architecture
- CIRCE Library and map library
Laboratory
- Seismic hazard laboratory (LARS)

ISCR, Roma
- Libraries and Archives
The PhD candidates have the possibility to access the Library “Adolfo Venturi”, stocked with reference
material addressing everyone taking interest in preservation and restoration of the cultural heritage. PhD candidates will also have the opportunity to avail themselves of the Photographic archive of restoration documents, which gathers all the restoration works performed by the Institute.

Scientific laboratories
The PhD candidates will have the opportunity to carry out research by relying on the experimental facilities of four scientific laboratories (chemistry, material tests, biological studies, physics), as well as of the restoration laboratories.

ISPC- CNR
The candidates can also access to laboratories of ISPC_CNR Milano to develop research dealing with:

- Characterization of constituent materials of Architectural Heritage and understanding of their degradation processes;
- Development of new technologies and materials for the conservation of cultural heritage;
- Development of innovative criteria for planning and carrying out conservation treatments.

Doctoral program – secretarial services:
Dott.ssa Marina Bonaventura
Department of Architecture and Urban Studies
Tel.: 02-2399.5165 - Fax: 02-2399.5435
e-mail: marina.bonaventura@polimi.it

Marilena Mastalli
Department of Architecture and Urban Studies
Tel.: 02-2399.5405 - Fax: 02-2399.5435
e-mail: marilena.mastalli@polimi.it

Doctoral program – administrative services:
Arch. Gloria Paoluzzi
Department of Architecture and Urban Studies
Tel.: 02-2399.5550
e-mail: gloria.paoluzzi@polimi.it

8. Internationalisation and inter-sectoriality
Study and research activities in external laboratories are strongly recommended. Politecnico di Milano supports joint PhD paths with International Institutions, as well as Joint and Double PhD programmes. Further information is available on the PhD School website and on the PhD programme website.

More specifically, the PhD programme in Preservation of the Architectural Heritage collaborates with:
- UNIVERSITAT DE VALÈNCIA – Double Doctorate
- UNIVERSIDAD DE CASTILLA-LA MANCHA - cotutelle agreement;
- UNIVERSITE’ PARIS I - PANTHEON SORBONNE – stage, co-supervised theses;
- ETS DE ARQUITECTURA DE GRANADA, teaching activities, exchange;
- SCOTTISH CENTRE FOR CONSERVATION STUDIES, UNIVERSITY OF EDINBURGH, stage, co-
supervised theses;
- XI’AN JIOTONG UNIVERSITY, exchange for teaching activities;
- ETHZ, Zurich, Switzerland, exchange for teaching activities.

Other international agreements
VIED - Viet Nam Government (31th cycle);
CSC – Chinese Government (32th cycle, 34th cycle, 35th Cycle)
MAECI - Ministero degli Affari Esteri (33th cycle)

Interaction with and exposure to non-academic sectors provides significant benefits to doctoral candidates as well as to research and innovation intensive employment sectors. Direct exposure to the challenges and opportunities in non-academic sectors of the economy and society at large is fostered by networking, connectivity, inter-sectoral mobility and wide access to the knowledge. In particular, the PhD programme in Preservation of the Architectural Heritage collaborates with the following Research Agencies:
ISPC-CNR, Istituto di Scienza del Patrimonio Culturale; (co-supervised theses, Laboratories, teaching activities);
ISCR, Istituto Superiore per la conservazione e il restauro, Teaching activities;
Attachment A1 – PhD Programme Coordinator

Short CV of Programme Coordinator
Mariacristina Giambruno
architect, PhD in Preservation of Architectural Heritage and graduated in Restoration of Monuments, she teaches at School of Architecture, urban planning, construction engineering and Graduate School in Architectural and Landscape Heritage (Politecnico di Milano).
Member of Faculty board of PhD programme in Architecture, Urban design, Conservation of Housing and Landscape, she is Head of PhD programme in Preservation of Architectural Heritage (Politecnico di Milano) from 2019.
Her teaching and research activity is oriented on history and theory of architectural heritage, conservation of historical heritage, historical centers conservation and management, together with guidelines and management plans to preserve and valorize cultural heritage.
In recent years, she has focused part of her activity in emerging and transition countries, working and directing international projects in collaboration with organizations such as UNESCO, World Bank, AICS in Albania, Iran, Armenia, China, Pakistan, Vietnam. In these countries, she has investigated the role of cultural heritage as “trigger” for sustainable development.
Speaker at conferences in Italy and abroad, she held courses and workshop in Armenia, Vietnam, Iran, Portugal, where she is part of a research unit coordinated by the Lusita University of Lisbon. She authored about 130 publications on preservation of historic centers and architectural heritage.

Attachment A2 – PhD Faculty Board

Description of the composition of the Faculty Board

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
<th>Scientific Disciplinary Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mariacristina GIAMBRUNO</td>
<td>Politecnico di Milano, Full professor</td>
<td>ICAR/19</td>
</tr>
<tr>
<td>(coordinator)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carolina DI BIASE</td>
<td>Politecnico di Milano, Full professor</td>
<td>ICAR/19</td>
</tr>
<tr>
<td>Claudio Chesi</td>
<td>Politecnico di Milano, Full professor</td>
<td>ICAR/09</td>
</tr>
<tr>
<td>Alessandra OPPIO</td>
<td>Politecnico di Milano, Full professor</td>
<td>ICAR/22</td>
</tr>
<tr>
<td>Annunziata Maria OTERI</td>
<td>Politecnico di Milano, Full professor</td>
<td>ICAR/19</td>
</tr>
<tr>
<td>Marco Andrea PISANI</td>
<td>Politecnico di Milano, Full professor</td>
<td>ICAR/09</td>
</tr>
<tr>
<td>Giovanna FRANCO</td>
<td>Università degli studi di Genova, Full professor</td>
<td>ICAR/12</td>
</tr>
<tr>
<td>Giulio MIRABELLA ROBERTI</td>
<td>Università degli studi di Bergamo, Full professor</td>
<td>ICAR/19</td>
</tr>
<tr>
<td>Name</td>
<td>Institution</td>
<td>Position</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Stefano MUSSO</td>
<td>Università degli studi di Genova,</td>
<td>Full professor</td>
</tr>
<tr>
<td>Francesca Lucia Maria ALBANI</td>
<td>Politecnico di Milano,</td>
<td>Associate professor</td>
</tr>
<tr>
<td>Alberta CAZZANI</td>
<td>Politecnico di Milano,</td>
<td>Associate professor</td>
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<tr>
<td>Marica FORNI</td>
<td>Politecnico di Milano,</td>
<td>Associate professor</td>
</tr>
<tr>
<td>Gianfranco PERTOT</td>
<td>Politecnico di Milano,</td>
<td>Associate professor</td>
</tr>
<tr>
<td>Serena PESENTI</td>
<td>Politecnico di Milano,</td>
<td>Associate professor</td>
</tr>
<tr>
<td>Massimiliano BOCCIARELLI</td>
<td>Politecnico di Milano,</td>
<td>Associate professor</td>
</tr>
<tr>
<td>Cristina TEDESCHI</td>
<td>Politecnico di Milano,</td>
<td>Associate professor</td>
</tr>
<tr>
<td>Paolo FACCIO</td>
<td>Università IUAV di Venezia,</td>
<td>Associate professor</td>
</tr>
<tr>
<td>Giovanni MENNA</td>
<td>Università degli studi di Napoli</td>
<td>Associate professor</td>
</tr>
<tr>
<td>Andrea PANE</td>
<td>Università degli studi di Napoli</td>
<td>Associate professor</td>
</tr>
<tr>
<td>Antonella E. SAISI</td>
<td>Politecnico di Milano, DABC,</td>
<td>Associate professor</td>
</tr>
</tbody>
</table>

**non-academic staff**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>ICAR Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maurizio BORIANI</td>
<td>Expert (art. 6, c. 4)</td>
<td>ICAR/19</td>
</tr>
<tr>
<td>Maria Antonietta Crippa</td>
<td>Expert (art. 6, c. 4)</td>
<td>ICAR/18</td>
</tr>
<tr>
<td>Barbara Davide</td>
<td>Research director ISCR (ex ICR)</td>
<td>L-ANT/01</td>
</tr>
<tr>
<td>Alberto Grimaldi</td>
<td>Expert (art. 6, c. 4)</td>
<td>ICAR/19</td>
</tr>
<tr>
<td>Marco Realini</td>
<td>Lead Researcher ICVBC-CNR</td>
<td>CHIM/12</td>
</tr>
<tr>
<td>Antonio Sansonetti</td>
<td>Researcher ICVBC-CNR</td>
<td>CHIM/12</td>
</tr>
<tr>
<td>Ornella Selvafolata</td>
<td>Expert (art. 6, c. 4)</td>
<td>ICAR/18</td>
</tr>
</tbody>
</table>
# Attachment A3 – PhD Advisory Board

## Description of the composition of the Advisory Board

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Eugenio Vassallo</td>
<td>Past professor IUAV Icar 19</td>
</tr>
<tr>
<td>2. Roberto CAMAGNI</td>
<td>Professor Emeritus (Urban Economy, Politecnico di Milano)</td>
</tr>
<tr>
<td>3. Carla DI FRANCESCO</td>
<td>Director Scuola dei beni e delle attività culturali</td>
</tr>
<tr>
<td>4. Javier GALLEGRO ROCA</td>
<td>Catedrático de Restauración Arquitectónica, ETSA, Universidad de Granada (Spain)</td>
</tr>
<tr>
<td>5. Antonella RANALDI</td>
<td>Soprintendente Archeologia, Belle arti e paesaggio per la città metropolitana di Milano</td>
</tr>
<tr>
<td>6. Cristina Sabbioni</td>
<td>Past director Istituto di Scienze dell’Atmosfera e del Clima (ISAC-CNR)</td>
</tr>
</tbody>
</table>