



POLITECNICO
MILANO 1863

PhD School of Politecnico di Milano

**Regulations of the
*PhD Programme in Architecture, Built Environment
and Construction Engineering (ABC-PhD)***

Cycle XXXVIII

Campus: Milano Leonardo
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1. General Information

1.1 Executive summary

We are a *Doctoral Program on Architecture, Built environment and Construction engineering (ABC-PhD)* established in 2012, heritage of five older programs active since the first institution of *Dottorato di Ricerca* in Italy (from 1988 to 2016) that progressively merged in one with the aim to realize a national *Point of Reference* for training researchers and experts in our fields.

Our working field includes any critical subject or question related to:

- the sustainable digital and green transformation, management and evaluation of the *built Environment*, holistically viewed as an “environmental, economic, cultural and social ecosystem” or as time and space series of *architectures* and *cultural landscapes*;
- the *engineering* of their parts (buildings and components, structures and infrastructures, materials, technologies and service systems); and
- the organization of the *production* and *industrial system* that design, realize, manage and transform them as well as of the *Public Administration system* that defines the rules for taking care (and takes care) of their values as social assets.

1.2 The ten pillars and the main organization principles

The Program pursues *ten pillars*, which are strongly coherent with the *Salzburg Principles* (2005) and *Recommendations* (2010).

Our Candidates:

1. are chosen in a *transparent, efficient and supportive, open selection process*;
2. are independent, constantly mentored, *early stage researchers*;
3. are *trained for research through research*;
4. have a Research and Training plan *tailored on their topics and objectives*;
5. are systematically and independently, periodically *reviewed and assessed*;
6. are *embodied in the Department Research activities* and all its competencies;
7. network with other researchers, at a *national and international level*;
8. keep clear track of their work in the scientific journal and conference networks;
9. do their best to establish relations with the stakeholders of their work; and
10. are active part of a growing Quality Management System for the improvement of the Program.

The attainment of the ABC-PhD title requires three things to the *Candidates*:

- to plan and carry out a *three-year* (with the exception of a few plans that may be organized on a four-year basis), *full-time activity* in doctoral research and training;
- to attend and pass, with a positive evaluation, the planned *Doctoral Courses*; and
- to develop a *PhD thesis* producing original *advancement* on a specific *topic* and to present and successfully defend it, in a *Final Exam*.

Coursework is not the centre of ABC-PhD Program, although we may boast a rich, diverse and even growing educational assortment, thought to integrate Candidate research skills, coupled with PhD School’s *transferrable skills courses*, and other PhD Programs’ ones.

The most important is the continuous mentoring and monitoring activity performed by *Supervisors* on their Candidates’ daily work, and the periodic, deep reviewing and assessment of their Candidates’ plans, products and results, performed by *Tutors, Board’s Members* and *external Reviewers* during periodical *Milestones* (see 6.2). Each Candidate is progressively pushed to confront her/his position, project, intermediate and final

results with any stakeholder that may acknowledge, enhance, valorize and exploit them, in particular through industrial or social collaborations. This is often done even before the selection of the Candidate, when the offered scholarships are funded or jointly funded by industry or international research projects involving industrial partners or other entities.

We are sure that our early stage openness toward stakeholders, Academy in general and scientific networks is the best way to provide future PhD Holders with occupational opportunities: for an academic career as well as for an employment in research centres, and in any other enterprise, public body or private societies that need highly qualified personnel trained to innovate.

1.3 Scientific Sectors, Disciplines and ERC Panel structure reference

Following the Italian *List of Academic Disciplines for University Research and Teaching*, ABC-PhD refers to four *Main Areas* and twenty different *Disciplines* (in red the reference to the ERC panel structure code¹):

- **Area 08 – Civil engineering and architecture**
 - ICAR/05 – *Transportation* (ERC Code PE8_3/SH2_8)
 - ICAR/06 – *Surveying and Mapping* (ERC Code PE2_15/PE10_14/SH2_12)
 - ICAR/07 – *Geotechnics* (ERC Code PE8_3)
 - ICAR/08 – *Structural Mechanics* (ERC Code PE8_3/PE8_4/PE8_8)
 - ICAR/09 – *Structural Engineering* (ERC Code PE8_3)
 - ICAR/10 – *Building Design* (ERC Code PE8_3/PE8_11/PE8_12)
 - ICAR/11 – *Building Production* (ERC Code PE8_3/PE8_9/PE8_10)
 - ICAR/12 – *Architectural Technology* (ERC Code PE8_3/PE8_10/PE8_11/PE8_12)
 - ICAR/15 – *Landscape Architecture* (ERC Code PE8_3/PE8_11/PE8_12/PE8_13/LS9_4)
 - ICAR/14 – *Architectural and Urban Design* (ERC Code PE8_3/PE8_11/PE8_12/PE8_13)
 - ICAR/17 – *Architectural, Urban and Environmental Drawing* (ERC Code PE8_3/SH2_9/SH2_11)
 - ICAR/18 – *Architectural History* (ERC Code SH5_6/SH5_7/SH6_8/SH6_14)
 - ICAR/19 – *Architectural Restoration* (ERC Code PE8_3/SH5_7/SH5_8/SH5_12)
 - ICAR/20 – *Urban Planning* (ERC Code PE10_20/SH2_10/SH3_1/SH3_3/SH3_9)
 - ICAR/21 – *Urban design and landscape* (ERC Code PE8_3)
 - ICAR/22 – *Appraisal* (ERC Code PE8_3)
- **Area 09 – Industrial and information engineering**
 - ING-IND/11 – *Building Physics and Building Energy Systems* (ERC Code PE8_3/PE8_6/LS9_5/SH2_8)
- **Area 13 – Economics and statistics**
 - SECS-P/06 – *Applied Economics* (ERC Code SH2_9)
- **Area 06 – Medicine**
 - MED/42 – *Hygiene and public health* (ERC Code PE8_3/LS7_8/LS7_9/LS7_10/SH3_9)
- **Area 10 – Science of Antiquities**
 - L-OR/02 – *Egyptology and Coptic civilization* (ERC Code SH6_2, SH6_3)

Websites: <http://www.polimi.it/phd> (PhD School)
<http://www.dabc.polimi.it/en/abc-phd/> (Department)
<https://beep.metid.polimi.it/web/abcphd> (Announcements, events and basic info)

¹ With reference to the ERC Panel Structure 2020, see https://erc.europa.eu/sites/default/files/document/file/ERC_Panel_structure_2020.pdf

2. General Presentation – The ABC-PhD Programme

"Dottorato di Ricerca" is the highest level of education degree within the Italian academic system and is equivalent to the North American "Doctor of Philosophy", well known through its acronym *Ph.D.*, that we will more familiarly write without dots (PhD).

The *PhD Degree* is awarded by Italian *Doctoral Schools* established in each university, organized in *Doctoral Programmes*.

2.1 Research lines

Research and training activities of each ABC-PhD Candidate will be planned and developed according to the [Strategic Research Plan](#)² of the ABC Department, which is revised on a regular three-year basis. Minor revisions to the Strategic Research Plan may be introduced, if necessary, to account for important global events, societal changes, or major directives. The current Strategic Research Plan was established on 2020 and will be revised on 2023. The Plan is structured on the following Six Strategic Research Lines (details can be found at the link reported above):

1. Innovative projects for architecture, spaces and services;
2. Digital, energy and technological transformation for the built environment and the construction industry;
3. Advanced materials and components, clean tech and innovative manufacturing and construction technologies;
4. Risk reduction strategies for the built environment;
5. History, science, technology, management and development of cultural heritage and landscape; and
6. Cooperation and technology transfer for emerging countries (with a special focus on Africa).

² www.dabc.polimi.it/ricerca/linee-di-ricerca-strategiche/

3. Objectives

The aim of every *PhD Programme* is the development of a *research-oriented mind-set* and high-level expertise and skills, in a specific research field and for related applications. This means to acquire analytical and problem-solving capabilities, to be able to transform solutions in methodology, methodology in knowledge, knowledge in science and, again, science in solutions.

The holders of a Doctoral Degree are **problem settlers**, trained to model complex environments, to understand complex questions and to apply critical thinking. They are **problem solvers**, trained to turn **uncertainty** in methodology and to turn doubts in reliable solutions. Eventually, PhD-Holders are trained to *create* information, forged in **high-level communication skills**, educated **to compete** as well as **to cooperate**, tempered in complex multi-disciplinary and multicultural environments.

3.1 ABC-PhD mission

The *mission* of ABC-PhD Programme is *to train researchers and experts* endowed with:

- High-level scientific *knowledge*;
- Significant experience in *Research and Development (R&D)* activities; and
- Proven *communication and management* skills, applied to R&D activities.

The main aim of ABC-PhD Programme is **to train researchers and experts** for the extensive field of **Architecture, Built Environment and Construction Engineering**. Our Candidates are trained to face *complex questions*, to develop *in-depth analysis* and *reliable models* (theories) of *complex contexts* (physical, economic, environmental or social systems), and to *innovate*: concepts, products and their use, rules and organisations. Moreover, ABC-PhD Programme aims to work as a drive system between Academy (the Department and the world of research in general) and other non-academic entities, activating a continuous *knowledge transfer* toward these and giving back to Academy the great value of research motivations and inputs.

3.2 ABC-PhD Vision

Our *vision* wishes:

- Our *ABC-PhD Doctors* to become self-sufficient, independent "actors", able to gain – as *scientist*, as *intellectuals*, as *professionals*, as *entrepreneurs* – an outstanding position at an international level;
- Our *ABC-PhD Programme* to become – in few years from its start – the *Italian Point of Reference* for training experts in all the most critical subjects related to the sustainable transformation and management of the *Built Environment* (environmental, economic, social and cultural sustainability), viewed as "ecosystem."

4. Professional opportunities and job market

4.1 PhD Statistics

The most recent available statistics from ISTAT (National Institute for Statistics) about the employment clearly shows a constant competitive advantage of **Italian PhD Holders**, compared to other graduates ([ISTAT, 2018³](https://www.istat.it/it/archivio/224302)). Their employment Rate is very high in every scientific sector (on average, >93% are employed within four years after PhD graduation) and, the share of fixed-term employment is growing (>45%). A vast majority of all the contracts deal with research and development activities (>70%). The main advantage underlined by the statistical sample, interviewed about the overall satisfaction of their employment, is about their autonomy and independence.

The employment of PhD Holders in **Programs related to ABC Department**, in the last three years, is mainly in Italy (80%). The majority of them (54%) work in Research and Academic Institutions for the first two-three years (later years the share drops to, about 30% and is expected to decrease further in time) while other 46% of PhD Holders work in SMEs or as professional free-lancers, public institutions or large companies (very often in the R&D sector).

4.2 The *ABC-PhD Doctor* (the holder of an *ABC-PhD* title)

The *ABC-PhD Programme* is structured with a strong relationship with the homonym Department of *Architecture, Built Environment and Construction Engineering* and the Schools of Politecnico di Milano.

The three years of study and participation to the research activity of the Department (and of its joint foreign institutions), in relation and together with other researchers, thanks to the opportunity to spend a period in other international research centres, forge a deep knowledge of the academic world. Doctoral experience, nevertheless, offer Candidates also other opportunities than the ones in academia.

Candidates have the chance:

- To take part in “knowledge transfer” processes;
- To enter in contact with the stakeholders, private companies and public bodies, of their work;
- To face actual societal needs and to work for the future ones;
- To understand the value, the complexities and the potential of innovation; and
- To manage a dedicated budget for carrying out the research activities.

This, together with the habit of communicating and working in English, qualifies the Doctorate for positions offered by the best international universities and research centres as well as by other private and public institutions. PhD Holders are trained by academic world but their proficiency and skills may be efficiently employed outside the academy, exploiting their best talent: **innovation**.

They have **knowledge and creativity** that can be applied to start as well as to support progressive and disruptive changing processes. They are young researchers able to promote development and progresses, with high profit, in any sector for which they are skilled and experienced and eased by that precious set of **relations** that they build during their training, roaming among experts, connecting expertise and gaining stakeholders' interest for their work.

These characters make Doctoral experience a **competitive advantage**, exploitable in an academic environment and in research centres, as well as in professional enterprises, public bodies and private societies

³ <https://www.istat.it/it/archivio/224302>

that need highly qualified personnel for activities, services and products related to construction processes, the transformation of the built environment and the management of its cultural, economic and physical assets, for planning and management of control activities and the critical assessment of any policy and project concerning the built environment and the built asset, for public and private bodies.

The *ABC-PhD Doctor* is expected to become:

- An **international investigator**, as Post-Doc, research fellows and young lecturer, in *Italian and international Universities and Research Centres*;
- A **highly qualified personnel** in the *R&D Department* or in the *Training Department* of private Companies or in *Technology Transfer Centres*, providing a deep and advanced insight and link between universities and the business world and assuming managerial roles with a strong focus on innovation;
- An esteemed **professional**, acting independently or in engineering and architectural firms;
- An entrepreneur, in contexts characterised by a high level of product and service innovation;
- A **project or construction manager** or a **facility manager**, for the Construction Industry, Real Estate and Asset Management;
- An independent **consultant** able to develop criticality analysis of any built environment transformation at a strategic as well as detail level; and
- An outstanding **intellectual**, at an international level.

4.3 Actions for PhD Holders

Universities, locally, and other national institutions already initiated actions to improve the appreciation of the added value of PhD Holders also outside Research bodies, in large as well as small and medium enterprises, and other public bodies.

The PhD School of Politecnico di Milano, as well as ABC-PhD Program, thanks to their [Career Service](#), are active in supporting PhD holders in their post-doctoral period in activities outside academy, for example in CV writing, training them for job interviews, enforcing their soft-skills and their understanding of jobs in private firms, from the last period before their final exam. Check in the PhD School site in the pages [After the PhD](#).

5. Enrolment in ABC-PhD Programme

5.1 Admission requirements

Graduated Italian and foreign citizens, with a good English Language proficiency, may apply to ABC-PhD Programme, following requirements, rules and suggestions collected in the PhD School site and in the Call.

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, **equivalent** for duration and content to the Italian title, with an overall duration of the university studies of at least five years.

The certified knowledge of the English language is a requirement for admission.

The admission to the programme will be established according to the evaluation of the (1) candidates' *curriculum vitae*, (2) individual *motivation letter*, and (3) a *proposal about the development of a possible PhD research*, which will be sent by the candidates within their application to the Call. Beyond the specific content of the *research proposal*, this will be evaluated to understand the attitude of the candidate to do research and will be potentially modified after the beginning of the effective PhD carrier.

An *Evaluation Commission* will assess the admission to the programme as specified in the admission procedure. The admission procedure may include an (optional) oral discussion, which can take place either in person or via remote media: *Evaluation Commission* may ask the Candidate to answer some questions, in order to have a better understanding of her/his research proposal and her/his real motivation, as well as to assess the knowledge of oral English language.

Please refer to the [PhD School website](#) for details.

5.2 Admission deadlines and vacancies

During the year four Calls for PhD vacancies are generally opened.

Two main types of open positions are available in accordance with the Call: about “general” topics and about “specific thematic topics.”

Positions with general topics: these Calls may cover any Scientific Sectors (SSDs – see par. 1.3) and research topics (see par. 2.1) dealt with in ABC Department. Some “orientation topics” may be suggested in the Call to better address the preparation of research proposals towards innovative and challenging topics that are interesting for the ABC Department. Positions under this category may be granted a scholarship or not.

Positions with thematic topics: these Calls have a predefined research topic and a proposed Supervisor. The candidate applying for a thematic topic should prepare a research proposal in accordance with it.

Positions under this category are always granted a scholarship.

In the following, the characteristics of different Calls for the 38th Cycle are summarized:

Call	Application Deadline (indicative)	Starting PhD time	Types of positions
<i>General Call</i>	May 2022	1 st November 2022	<i>Positions with general topics (with/without) scholarships and positions with thematic scholarships</i>
<i>I additional Call</i>	August 2022	1 st November 2022	<i>Positions with thematic scholarships</i>
<i>II additional Call</i>	December 2022	1 st February 2023	<i>Positions with thematic scholarships</i>
<i>III additional Call</i>	February 2023	1 st May 2023	<i>Positions with thematic scholarships</i>

6. Contents of ABC-PhD Programme

As said above, the main objective of *ABC-PhD* is the training, in the wide area of *Architecture, Built Environment and Construction Engineering* for:

- A research-oriented mind-set;
- High-level analytical and modelling skills; and
- Deep expertise about a specific research topic, in a multidisciplinary culture.

As any other PhD Program, ABC-PhD requires a long, intense and constant work and a systematic production, to reach the very high aims stated in its Vision and Mission.

We are looking for highly motivated people, able to sustain a full-time engagement in training for research and researching as training. In the following sections, these Regulations define:

1. The general requirements for the attainment of the title and the main steps we expect;
2. The procedure for the development and monitoring of Doctoral activities;
3. The objectives and general framework of teaching activities;
4. The procedure for the presentation and approval of the research and development plan; and
5. Other procedures about yearly evaluations and other deep review activities (*Milestones*).

6.1 Requirements for the attainment of the title

The attainment of a PhD title in *Architecture, Built Environment and Construction Engineering* requires three **full-time** years of study and research activities. Some specific programmes may be organized on a four-year basis.

During *Doctoral Programme*, Candidates will:

1. Schedule, attend and pass, with a positive evaluation, the **Doctoral Courses** needed to complete their *skills* and to enhance their *knowledge* in their *research area*, as well as those transferable skills useful for their future as researchers (see 6.1.2, for details);
2. Develop a **PhD thesis** showing original *advancements* on a specific *Research Topic*; and
3. Present, discuss and defend it in a **Final Exam**, showing their *research expertise*, their *research-oriented mind-set* or *problem-solving aptitude*.

The length of the doctoral Programme may be extended for a maximum of one extra-year, without scholarship, if requested by the Programme Board. The Candidate, moreover, may obtain the suspension of attendance for motivated reasons, as reported in the Politecnico di Milano's *Regulations on Research Doctorates*.

To obtain the best from this long period of work, a detailed research and training activities **planning** is a fundamental duty of the same Candidate. The **approval** and the **control** of the plan is a duty of the Candidate's *Supervisors* and the *ABC-PhD Programme Board*, as specified in the following sections.

6.1.1 The plan of Doctoral activities and the PhD Agreement

Candidates shall plan their research and training activities, in accordance with their *Supervisors*, detailing it in a **research and training plan** (formerly *R&T Plan*), giving evidence of their aims and of the global amount of time to be spent in each of them. Starting from the 38th Cycle, this research and training plan will be part of the **PhD Agreement**, which establishes duties and rights of PhD Candidates and his/her Supervisor.

The *PhD Agreement* will be endorsed by Candidate's *Supervisor*, and reviewed and approved by the *ABC-PhD Programme Board*. The total amount of time spent in each activity must be realistic and coherent with their effective outcomes.

The time schedule, the modality for preparing and modify the *PhD Agreement* will be timely noticed by the ABC-PhD Office after the starting of the PhD activities. Anyway, the period when the *PhD Agreement* should be uploaded is approximately *in* the second part of the first year.

6.1.2 The Training Activities and their choice

The *PhD Agreement* is complemented by the *Study Plan* including the **Training Activities**.

Candidates from the 37th Cycle are requested to plan a **minimum** of 40 ECTS⁴ of *Training Activities* to complete their knowledge about the chosen *Research Topic* and to refine the skills needed for preparation of the PhD Thesis and its intermediate steps. Training Activities are organized in three categories, each of them to be independently completed with no chance of mutual compensation:

1. 10 ECTS to be acquired by attending *Doctoral Courses* on transversal skills in the *PhD School Catalogue*;
2. 15 ECTS to be acquired by attending *Doctoral Courses* from the ABC-PhD Programme, or from other PhD-Programmes at Politecnico di Milano (including the *PhD School Catalogue*) and in other Universities and Research Centers; MSc courses might be chosen as well; and
3. 15 ECTS assigned on the basis of the attendance of a cycle of six seminars/workshops (Milestone One-Two-Three-Four-Five-Six Trainings) organized by ABC-PhD to train on different phases of the PhD development as marked by periodical Milestones (see 6.2): literature review and state-of-the-art, organization of a research project, scientific writing, scientific communication and public speaking, dissertation writing, dissemination of research outcomes. These courses are included in the Study Plan one per year by following these mandatory courses:
 - On the **First Year: Milestone Training First Year – Milestones One-Two (5 ECTS)**: state-of-the-art and research project;
 - On the **Second Year: Milestone Training Second Year – Milestones Three-Four (5 ECTS)**: scientific writing and scientific communication and public speaking; and
 - On the **Third Year: Milestone Training Third Year – Milestones Five-Six (5 ECTS)**: dissertation writing and dissemination of research outcomes.

Since these training courses are devoted to those Candidates from the 37th and 38th Cycles only, the Course Catalogue for the Academic Year 2022-2023 will merely contain the *Milestone Training First Year* and the *Milestone Training Second Year*. The last *Milestone Training Third Year* will be activated from A.Y. 2023-2024 on.

In the case the Candidate has already followed a course (e.g., from the *PhD School Catalogue* or during other activities) covering those topics in the *Milestone Training Third Year*, the attendance of this training will be optional (or limited to a part of it).

In any case these selections should be approved by the Supervisor and the Programme Board.

As the research training of Candidates is mainly obtained through mentored research activities, Doctoral Courses must not exceed the total **maximum** amount of **65 ECTS**, in the whole *Doctoral Programme*.

⁴ ECTS is the acronym for *European Credit Transfer and Accumulation System*, a [Bologna Process](#) tool aiming to make National Academic systems, in EU, compatible and comparable, in terms of workload and learning outcomes.

It is based on the following equivalence: 60 ECTS credits are associated to one full-time academic year.

The measure of the engagement of the student of a *Doctoral Course* is based, as well as for other levels of qualification (Master, Bachelor) on the *European Credit Transfer and Accumulation System* (ECTS). The workload for a standard 5 ECTS PhD course, in Politecnico di Milano, account for about 35 hours of formal lectures, seminars and workshops activity, plus the individual study required to achieve the defined learning outcomes and to produce the stated home-work (one credit corresponds to 25 to 30 hours of work; see the *ECTS Users' guide*, downloadable [here](#))

As ABC-PhD Candidates are expected to acquire a multidisciplinary character, they may choose, if useful to complete their culture and education to research and positively related to their field of interest and Research Topic, also Courses outside of ABC-PhD Catalogue and not strictly connected to their major discipline, with the help of their *Supervisors*. Candidates are not only strongly invited to make this choice in accordance with their Supervisors but also to discuss with them the details of their exam work, in case they will be requested to propose something related to their thesis work or their thesis subject. It is recommended that the recognition of any course that is not listed in the university catalogue (including all courses at Doctoral and MSc levels) should be approved by the ABC-PhD Board, which will evaluate the specific programme and the inherence to the education track of the candidate. It is also recalled that a course should be completed by a final evaluation to be recognized. In the case this is not available, the course will be registered in the Study Plan with the evaluation "N.D." (not available).

Eventually, the *Board* may ask *Candidates* to attend specific **preparatory courses**, when they need to fill specific gaps between their competencies and the advanced skills needed to complete the chosen research projects or to face a specific topic. In this case, some extra-credits to be acquired are assigned. The credits acquired in this way will be considered as additional, in relation to the mandatory credits. As Research Topics may be also defined before the official start of the Programme (e.g., for *Thematic Scholarships*), the *Head of the Board* (or his Delegates) may interact with registered Applicants, also before the official start of their Program, in order to draft their proposed *Study Plan* and to let them attend Doctoral Courses, as soon as possible.

6.1.3 Research and other activities

Courses usually account for the first, introductory, commitment of PhD Candidates, but not for their main work, that mainly consists in taking part in Department's *Research Activities*, to obtain direct experience in research design, planning, management and production of original research, up to the communication and marketing of their results. *Research Activities* must be detailed in Candidate's *PhD Agreement* and planned under the guidance of the Supervisor.

Candidates are also expected to take part of:

- *Conferencing activities* (attending and preparing presentations in research meetings, working groups and conferences), in particular, Seminars, Conferences and Workshops organized by the ABC Department (Candidates are expected to be involved in the definition, organization and management of these events, not only in passively taking part in them: see the ABC PhD OPENTalks) or Visiting Researcher's groups;
- *Networking and Technology Transfer activities* (encouraged as opportunities for profitable confrontation with the stakeholders of research activity, from the earliest moments);
- *Submitting and attending the preparation of proposals for internal* (the ABC Department periodically promotes some calls for funding activities to support the scientific research and the third mission) *and external funding*; and
- *Writing and publishing*: **a PhD candidate is expected to publish at least one paper indexed in Scopus and/or Web-of-Science per year, or in a journal in the Class A according to the internal classification ranking at ABC Department. Since the 38th Cycle, this requirement will be mandatory for the admission to the 3rd/4th year and for the Admission to the Final Exam.** In the case this requirement is not fulfilled and the Candidate does not give solid motivated reasons, the passage to the following year will not be possible.

As far as this last topic is concerned, ABC-PhD Programme encourages publication:

- Candidates are expected to write and to start publication activity as soon as possible, about topics related to their Research Project or other synergic ones, in order to gain a direct experience of the external review process at the basis of every relevant *Scientific Conference* and *Scientific Journal*, and the earliest visibility of their work;
- Their commitment in publication activity is expected to grow together with their autonomy; and
- Full authorship is, in particular, expected at the end of their PhD Program.

Nevertheless, **ABC-PhD is not a “PhD-by-publication” programme** (see also the next 6.1.5, about “The PhD Thesis”).

Candidates’ publication activity must be guided and reviewed, as well as any other public activity, and authorized by their Supervisors. Such a control is mandatory during their entire Program and whenever they present themselves as ABC-PhD Programme Candidate or Politecnico di Milano PhD Student (see 6.1.3).

While PhD candidates are encouraged to take part to any activity that may contribute to promote the individual research and transversal/soft skills, it’s important that the focus on the main research project is maintained. For this reason, **the participation to any activity that is not strictly related to the main research programme, should be preventively authorized by the Head of ABC-PhD, who anyway should be always informed.** In case the Candidate pursues some activities that are not declared but influenced (directly or indirectly) the PhD activities, *the ABC-PhD Programme Board* will consider this omission in the EoY evaluation, and it may imply the repetition of the year.

6.1.4 The External Period

A period spent in external institutions (International laboratories or Research Centres, Italian or foreign Companies or other external research Bodies and Universities) with other working groups, as “visiting PhD” or apprentice or equivalent form, is **warmly encouraged** (but not strictly mandatory, with the exception listed below) to acquire a deeper insight of Candidate’s research topic. While the length of staying abroad should be preferably of 3-6 months, a longer external period is possible up to 18 months but must be authorized by the *ABC-PhD Programme Board*. An increase of the amount of the Scholarship is allowed up to a maximum of six months.

Some specific scholarships may include special requirements for the period abroad, as stated in the description linked to the call. These may entail a longer period (up to 18 months) abroad in a partner institution, and/or the mandatory character of the staying abroad for a predefined period. The acceptance of a scholarship with these special rules will imply the total acceptance of the period abroad for the predefined time stated in the call.

Politecnico di Milano proposes also the opportunity of jointly supervised PhD paths, with foreign universities and double PhD Programmes. Further information is available on the PhD School Website or can be queried to the ABC-PhD Office (see 7.1).

In the case some major causative reasons (e.g., the COVID-19 pandemic) prevent or limit travelling and staying abroad, the ABC-PhD Board will take into account them and will propose alternative forms of international cooperation, if possible.

6.1.5 The PhD Thesis

PhD Candidates are expected to study, take lessons, work hard for a long period and to become active part of a scientific community (at a global as well as at a local scale), but they are also expected to produce a **significant, original contribution** to a specific knowledge field, to organize this contribution in a **dissertation** (the *PhD Thesis*) and to **defend** it publicly (viva voce) in front of a committee of experts.

At the end of the third year (or later), after its Admission to and before the Final Exam (FEA), the *Candidate’s*

thesis will be reviewed and its original contribution assessed by two independent academic *External Examiners*. Eventually, the final PhD-Exam will be organized. An examination Committee, composed by three members, of which at least two *External Evaluation Members* (it's possible but non mandatory that these *External Evaluation Members* are also *External Examiners*) will evaluate the final thesis evaluated and its viva-voce defence.

WARNING: Candidates may partially anticipate the results of their work in publications, but the final dissertation must be something more than a simple sum of their publications. As the value of a PhD Holder is assessed based on the *original advancements* achieved during her/his Programme, PhD Candidates must, as soon as possible, focus on their PhD Thesis or, in alternative, must start weaving through their activities and their results (publications but not only) a sort of **red thread** that will make them visible as a unique one.

6.1.6 Activities as teaching assistant

PhD Candidates may take part to Teaching activities about subjects closed to their PhD Thesis topics. Teaching of any types (i.e., BSc, MSc, Master programmes and others) may be good occasions for training in education and communication of research. However, such "extra-work", to be conducted in parallel of the ordinary activities, should not exceed a reasonable amount of teaching hours per year, in order not to limit too much the time for doing research. This amount will be evaluated case by case by the *ABC-PhD Programme Board*, that may also completely limit the participation to this kind of activities.

Authorization by the Head of ABC-PhD programme is necessary to participate to competitive calls to obtain temporary retributed appointments as teaching assistants.

Some scholarships may not allow at all the participation to teaching assistant activities in order to let the PhD Candidate totally focus on research. In such a case, this requirement should be explicitly reported in the Call.

6.2 Development and monitoring of Doctoral activities

The activity of *ABC-PhD Candidates* will be organized in the following ten phases:

1. Choice of the **Research Topic** and official appointment of the **Supervisor** by the ***ABC-PhD Programme Board***;
2. Definition (and review) of the **State of the Art** for the chosen Research Topic (Milestone **One**);
3. Definition (and review) of the **Research Project** (Milestone **Two**);
4. Presentation (and review) of the **Position Report** (Milestone **Three**);
5. Definition (and review) of the **PhD Thesis Structure** (Milestone **Four**);
6. Presentation (and review) of the **First Draft of the PhD Thesis** (Milestone **Five**);
7. Presentation (and review) of the **Final Draft of the PhD Thesis** (Milestone **Six**);
8. **Admission** to the Final Exam (**FEA**);
9. **Evaluation** of the PhD Thesis (by at least two, independent, academic **External Experts**); and
10. PhD Thesis defence (**Final Exam**).

The general content of these ten phases, in terms of work to be presented, is detailed in the following sections, while the exact timescale and schedule is defined, yearly, by the *ABC-PhD Programme Board*.

Milestones will be organized in the form of a open, public, roundtable meetings (*Milestone Sessions - MS*) among a little number of *PhD Candidates*, chosen following the affinity of their topic and their collaboration and sharing potential.

Each *Milestones* has associated a type of document to be uploaded in the Candidate's *Personal Online Repository* before a submission deadline (in general at least 20 days before the start of the *Milestones*). Each Candidate's discussion is supported by a presentation, to fit in the maximum time communicated before each

MS. The review documents of each document will be transmitted to the Candidates.

Milestones are divided into two main categories:

1. **Deep-Review Milestones** (namely *Milestones One, Three, Five*), with the aim of deeply reviewing the activity done so far by the Candidates (without any formal evaluation); and
2. **End-of-Year (EoY) - Evaluation Milestones** (namely *Milestones Two, Four, Six*), with the aim of reviewing the activity done so far by the Candidates but also to decide the *EoY Evaluation* and the advancement to the following year (and – when ready – the *Admission to the Final Exam - FEA*).

Milestones are scheduled on a regular basis, to take place at approximately six months steps from the beginning. Any official break in the individual carrier may introduce a consequent modification in the milestone schedule of the Candidate, to be decided case by case. In any case, when a break is finished, an extra formal check should be operated.

Candidates who follow a four-year programme (for instance in the case of Executive Programmes or international agreements) should reorganize their Milestone schedule according to their specific needs and the research topic.

In any case, the *Milestone Schedule* should be initially defined in the *PhD Agreement*, while successive changes tracked.

Milestones Sessions (MS) are organized based on the *Six Strategic Research Lines* of ABC Department (see Section 2). All PhD Candidates supposed to attend the Milestones are assigned to a specific MS, which gather Candidates sharing similar thematic subtopics in each *Strategic Research Line* (SRL). Each MS may include Candidates from diverse Cycles, to make easier a confrontation among them. A Chair and – optionally – one-two Co-Chair(s) coordinate each MS, with the main duties of selecting and inviting at least two *independent* experts to review the documents submitted by each Candidate and to contribute to the discussion. The document of a Candidate will never be reviewed by her/his Supervisor.

The *Chairs* of a MS will also have the role of defining the exact schedule of the meeting and preparing a written report about the advancements and the results of their work, the proposed assessments, the advice and suggestions to Candidates, as better specified in the description of each milestone type. These pieces of information should be reported to the *ABC-PhD Programme Board* as basis for the candidate assessment.

When a MS corresponds to an EoY evaluation, the Chairs will be responsible, together with the MS Committee (with the exclusion of the Supervisor of the Candidate under evaluation) to approve (or not) the enrolment into the following year (or the Admission to the Final Exam - FEA), and to propose an evaluation. These decisions should take into account those preliminary comments from the Supervisor of each candidate and will be discussed and approved later by the ABC-PhD Programme Board.

MS are organized twice per year during two main Milestone events:

1. **Spring Milestones** (on April) for Deep-Review Milestones One-Three-Five (and for EoY only of Candidates who started on May - Milestones Two-Four-Six and FEA);
2. **October Milestones** (on October) for EoY Evaluation Milestones Two-Three-Six and FEA (and for Deep-Review only of Candidates who started on May - Milestones One-Three-Five).

There are two other secondary Milestones events (**WMilestones** on January and **Summer Milestones** on June/July) devoted to host Milestones given by Candidates who started on February and for FEAs.

6.2.1 Before the official start

After registration, each *PhD Candidate* will receive an institutional (given_name.family_name@polimi.it) email address by Politecnico di Milano.

The *Research Topic* of Candidates with *Thematic Scholarship* is defined in the corresponding Call, together with the name of the predefined *Supervisor*. In such a case, before the official start of the 1st Year each Candidate must contact the assigned *Supervisor*, in order to better identify the *Research Topic*.

6.2.2 MILESTONE ONE – State of the Art

The first period of Candidate's work is – usually – devoted to the exploration of the state of the art, to *Doctoral Courses* and to other basic training activities. The main purpose of this initial period is to consolidate the choice of the *Research Topic*, to obtain a deep understanding of the research activity about it, and to define the main objectives of her/his work.

In the **first semester of the First Year**, the ABC-PhD Programme Board will appoint (or confirm in the case of *Thematic Scholarships* – see par. 6.2.1) each candidate a **Supervisor** and a **Tutor**, the latter chosen among members of the ABC-PhD Programme Board.

About six months after the start, the *Candidate* will be invited to submit and to present to the MS Committee the *State of the Art* of the *Research Topic* under investigation and the related *Reference Bibliography* for **Deep Review**.

The **State of the Art** will be realized in order to give a detailed picture of *People* and *Institutions* **who** produced the main advancements about the chosen *Research Topic*, their *Activity* (**what** – and **when** – they have done, are doing and are going to do), their *Reasons* (**why**), their *Networks* and their periodic appointments (**Conferences**). Attention should be also focused on past and ongoing *research projects* (especially at international level) and existing *patents*.

The **State of the Art** and the **Bibliography** will be continuously updated and upgraded during the whole PhD. The review of the research work and scientific networking already existing should not be intended as a mere list. As far as possible, PhD candidates are expected to start understanding and critically analysing the main topics and lines related to the research domain of interest.

Candidates will attend the **Milestone-One Training** to help prepare Milestone One.

6.2.3 MILESTONE TWO – Research Project

In the second part of the 1st Year PhD candidates are expected to focus their work and attention on the specific subject that will become their PhD Thesis within the end of their first year. They will still follow *Doctoral Courses* and perform planned research activities, but they are expected to define their proposal, giving consistency to their objectives, translated in a complete **Research Project**, that will be presented to the MS Committee for the **EoY Evaluation**. The *ABC-PhD Programme Board* shall take the results of the evaluation, assess the Candidate's **EoY Report** and give a synthetic evaluation of her/his activity, commitment and results, deciding about the admission to the Second Year (see Subsect. 6.5).

Candidates will attend the **Milestone-Two Training** to help prepare Milestone Two.

6.2.4 MILESTONE THREE – Position Report

During the third semester at the beginning of the Second Year, PhD Candidates may still follow *Doctoral Courses*, will take part to events or other research and scientific activities, if useful for their *Research Project* and for completing their training experience, but they are mainly expected to start publication activity and to expose some first results of their work to the Scientific society. At the end of their third semester, Candidates are expected to translate, under Supervisor's control, their *Research Project* in a *Position Report*,

to be submitted to the MS Committee for **Deep Review**. In particular, the MS Committee will test their ability in written communication and to assess the originality and the scientific relevance of their projects, as well as their feasibility. The submitted **Position Report** may be integrated with the analysis done with the Antiplagiarism tools offered by Politecnico di Milano.

Candidates will attend the **Milestone-Three Training** to help prepare Milestone Three.

6.2.5 MILESTONE FOUR – PhD Thesis Index

Before the end of their Second Year, PhD Candidates are expected to produce a clear view of their *Research Project* and to start structuring their PhD Thesis, under the guidance of their Supervisors. If useful for their *Research Project* and for completing their training experience, they may still follow *Doctoral Courses* and perform other research activities. The Second Year is, usually, the best period for a visiting staying in other Universities, Research Centres or other Institutions (but Candidates may, in theory, take the occasion for such an experience, in earlier or later periods).

At the end of their fourth semester, PhD Candidates will present the progress of their research activity in an Evaluation Milestone, explain their first results and give a complete picture of their work. A clear vision of their PhD Thesis, the main parts and the activities to be performed is expected. The MS Committee will evaluate it and the *EoY Report* and give a synthetic evaluation of Candidate's activity, commitment and results, deciding her/his admission to the third year.

Candidates will attend the **Milestone-Four Training** to help prepare Milestone Four.

6.2.6 MILESTONE FIVE – First Thesis Draft

The Third Year of the Doctoral Program shall be devoted to the preparation of Candidate's **PhD Thesis**.

After the end of the fifth semester, PhD Candidates are expected to present their **First Thesis Draft**, together with a synthesis of the results: planned, attained or not and still to be reached. The MS Committee will carry out a **Deep Review** to examine and assess the value and the originality of the PhD Thesis, the advancements and the feasibility to be completed.

Candidates will attend the **Milestone-Five Training** to help prepare Milestone Five.

6.2.7 MILESTONE SIX – Final Thesis Draft

At the end of the Third Year, PhD Candidates will present the final draft of their thesis to the MS Committee for the **EoY Evaluation**. If they have achieved sufficient results, they will be admitted to the **Final Exam** - FEA (see 6.5). A negative evaluation may imply a re-enrolment in the same year as a repeating candidate, but in general, PhD 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 Additional Year. Within the Additional Year, each PhD Candidate is supposed to repeat Milestone Six after six months as far as she/he is ready for the FEA. The FEA maybe applied at any *Milestone Events* (see Subsect. 6.2) and cannot be organized outside them.

When a PhD Candidate applies for the FEA, the thesis should be completed with the exception of editing, formatting and the possible lack of some minor parts to be completed (Conclusions are not considered a minor part!). The degree of completeness will be taken into account for the FEA evaluation.

The PhD Candidate, with the approval of her/his Supervisor, should submit a time-schedule planning for the completion of the dissertation before the *Final Exam*, taking into account the time necessary for the external revision. The Supervisor of the PhD Candidate should propose two independent *External Examiners* to be appointed for the evaluation of the *Final Thesis* before the *Final Exam*.

6.2.8 Thesis EVALUATION

In the case of positive evaluation of the FEA, the PhD Candidate is admitted to the *Final Exam*, to be completed within **five months**. After the FEA, the ABC-PhD Programme Board will approve the *External Examiners* proposed by the PhD Candidate or will suggest alternative names. At that point, the thesis will be submitted to them for revision. If they also provide a positive evaluation, the *Final Exam* will follow. The *External Examiners* may require some mandatory improvements to be implemented and delay the *Final Exam* up to six months. The revised version of the PhD Thesis must undergo a new evaluation by the *External Examiners*, after which (even in the presence of a negative report) the PhD Candidate will be admitted to the *Final Exam*.

In the case the *Final Exam* is not accomplished within five months after the FEA, the FEA should be cancelled and repeated.

6.2.9 FINAL MILESTONE – FINAL EXAM (or Thesis Defence)

In the *Final Exam*, the research work carried out by the PhD Candidate and her/his thesis will be evaluated by the *Defence Committee*. Such a committee will consist of three members, at least two of them do not belong to the staff of Politecnico di Milano (please refer to the latest version of the Rules of the PhD School of Politecnico di Milano). Different compositions are allowed in presence of specific agreements (Double Degree or Jointly supervised candidates) with other research Institutions or PhD Schools. The *Final Defence* will occur within five months following the FEA. In exceptional cases, the *Board* may establish an earlier date, in the last three months of the final year.

The *Defence Committee* can be created only once the PhD Candidate has been admitted to the *Final Exam* by the *ABC-PhD Programme Board*. The following deadlines should be respected before the established date for the *Final Defence*:

1. The ABC-PhD Office should register the *Final Defence* at least **45 days** in advance;
2. The PhD Candidate must register at least **30 days** before the Final Defence;
3. The PhD Candidate must upload the thesis at least **20 days** before it;
4. The *PhD Candidate's Supervisor* (or the *Head of ABC-PhD Programme*) will approve it at least **15 days** before the *Final Defence*, in order to grant access to the thesis to the *Defence Committee*.

The positive outcomes of a PhD defence are: 'PhD granted' or 'PhD granted cum Laude'. A negative outcome of the Final Exam is irreversible.

6.3 Objectives and general framework of the teaching activities

To support the attainment of the general training aims and the specific objectives of each Candidate, the *ABC-PhD Programme* will organize, together with the PhD School, a wide set of training activities, as well as research opportunities. Courses offered by the *ABC-PhD Programme* are updated in the official Page of the PhD School offer and anticipated here in a general form. The effective activation of each Course, nevertheless, depends on the number of registered students: if a reasonable number of registered students is not reached, the Course may be cancelled. Moreover, other Courses may be added during the year, following the identification of a specific training need.

The Course Programme (see below) may also comprehend some courses that are not offered in the current Academic Year, but they will be scheduled in the next one according to a two-year cycle. These courses that are not in the official Course Programme, will be communicated in a brochure describing the whole teaching activity of ABC-PhD Programme.

6.3.1. RESEARCH and TRANSFERRABLE SKILLS Courses offered by the [PhD School](#)

Name of the Course	ECTS
Approaches to Resilience: Social, Economic, Environmental and Technological Challenges of Contemporary Human Settlements Modeling and Automated Verification of Real-Time Systems	5
Cognitive biases and discriminations: implications, risks and opportunities	5
Creative Design Thinking	5
English for Academic Communication	5
Ethical Aspects of Research on Dual-Use Technologies	5
European Culture	5
How to support Complex decisions: Approaches and Tools	5
Industrial Skills	5
Innovative Teaching Skills	5
Introduction to Academic Research	5
La comunicazione nella Scienza	5
Power of Images and Visual Communication for Research Dissemination	5
Practicing Research Collaboration	5
Professional Communication	5
Project Management (In Action)	5
Project Management Basics	5
Research Communication. Issue mapping: exploring public debates surrounding academic topics	5
Research Skills	5
Science, Technology, Society and Wikipedia	5
Scientific Communication in English	5
Strengthening Critical Spatial Thinking	5
Sulla responsabilità tecnica	5
Teaching Methodologies, Strategies and Styles	5
The Copernicus Green Revolution for Sustainable Development	5

6.3.2. DIGITAL SKILLS Courses

Name of the Course	ECTS
GeoBIM for asset and facility management. Material culture & computational design techniques	5
Information technology for planning, architectural design and built environment management	5
Material culture & computational design techniques	5

6.3.3. DISCIPLINE RELATED SKILLS – Structures

Name of the Course	ECTS
Distinct element modelling of granular materials, rocks and stone structures	5
Experimental methods for structural mechanics	5
Fiber reinforced materials: manufacturing, mechanical properties, modelling, applications	5

6.3.4. DISCIPLINE RELATED SKILLS – Architecture

Name of the Course	ECTS
Architectural drawing. Past, present and future	5
Architectural theory & design seminar	5
Cutting-edge architecture: creativity and innovation	5
Future façades. Complexity, experimental methodology and executive design	5
Research, design and health. Strategies and methodologies to improve health promotion and disease prevention in contemporary built environment	5
Research relevance. Optimal application of evidence, knowledge and data in research work	5

6.3.5. DISCIPLINE RELATED SKILLS – Construction and Asset Management

Name of the Course	ECTS
Future-proof design for infrastructure and construction. Processes and methods to minimize the risk of inadequate level of service through time	5
Real estate (RE) process management and innovation	5
Strategies and tools for advanced building envelopes design towards resilient constructions	5

6.3.6. DISCIPLINE RELATED SKILLS – Heritage conservation and design

Name of the Course	ECTS
Cultural heritage conservation and valorization	5

6.3.7. MILESTONE TRAINING

Name of the Course	ECTS
Milestone training First Year (Milestones One-Two)	5
Milestone training Second Year (Milestones Three-Four)	5

6.4 Presentation and approval of the *Candidate's PhD Agreement*

The first version of the *PhD Agreement* should be prepared and uploaded by each Candidate by the deadline to be communicated at the beginning of the First Year (see. Par. 6.1.1).

The Supervisor will approve the *Candidate's PhD Agreement*, and any successive change of it, reporting to the *Head of PhD-ABC Programme*. The approval by the Head of PhD-ABC Programme is requested for any activity that will provide additional revenue to the Candidate, either from the Department or from other institutions, or if it is longer than one month. Each change of the *PhD Agreement* for a period longer than three months, as well as any significant change about the research topic, will require the approval of the *ABC-PhD Programme Board*.

6.5 Instructions for the yearly Evaluation Milestones and other reviews

At the end of each year, the *PhD Programme Board* will periodically meet each *PhD Candidate*, in a public (viva voce) Evaluation Milestone (types: Two, Four, Six), in order to monitor her/his advancements, results and plans. The *ABC-PhD Programme Board* in general appoints this task to a Milestone Committee. The *PhD Candidate* will be asked to submit:

- The updated *PhD Agreement*;
- The updated *EoY Report* (about active and completed Research and Training tasks); and
- An upgraded copy of Candidate's scientific outcomes, achieved or delivered in Courses, Research Activities, Scientific Journals or Conferences, or other public activities;
- The specific document related to the Milestone to attend.

The *Candidate's Supervisor* will endorse the *EoY Report* and submit a synthetic written evaluation of Candidate's activities.

The *ABC-PhD Programme Board* will give a motivated evaluation of Candidate's activities and results. If the evaluation is positive (possible scores: A/B/C/D), he will be admitted to the next year. Candidates who do not pass the end-of-year 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 definitely lose their scholarships – if any. In case the Faculty Board holds appropriate to directly assign an exclusion evaluation (Ei) without a previous repetition year, the request must be properly motivated, and validated by the PhD School.

7. Services and Benefits

7.1 ABC-PhD Office

The ABC-PhD Office will provide information to PhD Candidates about deadlines to be respected, Courses, Training Programmes, etc. *Foreign Candidates* are also supported with specific services such as Italian courses, housing, residence permits, the possibility of joining a double PhD course in agreement with foreign Universities.

The ABC-PhD Office should be contacted for any technical issues (travels, authorizations, courses, Study Plan, etc.) and request of information. Any request addressed to others may not be considered.

Communication with the ABC-PhD Office will be through the email: dottorato-dabc@polimi.it.

7.2 Budget for the research activity

Each PhD Candidate from the 38th Cycle is awarded a **budget** equal to 10% of the annual taxable amount of the scholarship for the research activity for three years (i.e. for the scholarship of € 1.275,00 the budget is € 1.732,54 per each year. Phd Candidates without scholarship are awarded with a budget of € 1.534,33 per each year). This budget can be used, prior authorization by the *Head of ABC-PhD Programme*, to fund (partially or totally) the participation to external training activities, summer schools, workshops and conferences, to purchase material related to the PhD research (whose owner will remain the ABC Department at the end of the PhD study period). This budget will be available since the beginning of the First Year and can be anticipated from successive years, depending upon the authorization by the *Head of ABC-PhD Programme*. The individual budget for research activities may be used also after graduation, but within the end of the last Academic Year to which the Candidate was registered (the A.Y. ends on 31st October). During this time, the budget may be spent for payments directly related to the dissemination of the PhD outputs (i.e., for attending conferencing, presentations, publication fees).

Under specific Thematic Scholarships, a higher budget for research activity may be available to afford special needs.

Anyway, **each activity must be preventively authorized by the Head of the ABC-PhD Programme and the Supervisor**. This occurs also in the case when funding does not come from the ABC-PhD budget. Candidates should also recall that any payment must be directly operated by the administration: **please do not anticipate money from your pockets because it will not be refunded!** Exceptions should be discussed in advanced with the ABC-PhD Office.

7.3 Financial aids and benefits

Each year, the Politecnico di Milano opens a call for the assignment of a *financial aid for doctoral students* who enrol or are going to enrol in a PhD programme, to encourage its attendance also by students without or limited financial means. The benefits are awarded through a competition based on an online application form, on the basis of specific financial and merit requirements.

For further information, visit the DIRITTO ALLO STUDIO UNIVERSITARIO (DSU) web page: [Politecnico di Milano: University Financial Aid - Diritto allo Studio Universitario \(DSU\) \(polimi.it\)](http://Politecnico di Milano: University Financial Aid - Diritto allo Studio Universitario (DSU) (polimi.it))

The Politecnico di Milano also opens a call for *scholarship supplements* (for participation in international mobility programmes) for the duration of a stay abroad (usually up to a maximum of 10 months) and for *subsidised accommodation in Regional Campuses*, for “away-from-home students” and *subsidized catering service*.

A special care is devoted to:

- *Foreign students coming from “developing countries”*, who are only requested to certify (through the Italian Representation in the country of origin) that they do not belong to a notoriously high-income, high-social status family;
- *Stateless or political refugee students* who must attach to their application the official statement certifying her/his stateless situation or status as political refugee as issued by the Italian Ministry of the Interior or by the delegated UN Office; and
- *Disabled students*, who may be granted, according to the type and level of disability, of individual merit requirements.

Students who have applied or intend to apply for financial aid must ask and give prompt written notice to the [Financial Aid and International Mobility Service](#).

7.4 Laboratories

ABC-PhD promotes experimental research.

The ABC-PhD Programme has the experimental support of all the laboratories of Politecnico di Milano.

The involvement of these Laboratories will be planned in the Training Programme and organized following the Training Programme needs. The ABC Department may offer experimental facilities within the [ABCLab](#)⁵.

⁵ <https://www.dabc.polimi.it/laboratorio/>

8. Internationalisation and other activities

8.1 From visiting periods to joint/double supervision and PhD titles

Networking with other researchers is always strongly recommended: at a national as well as at an international level. PhD Candidates are also invited to carry out study and research activities at other laboratories or institutions, to be carefully planned in a section of their *PhD Agreement*, agreed by the Supervisor and approved by the *ABC-PhD Programme Board* and the hosting Institution.

Moreover, PhD Candidates, as other students from Politecnico di Milano, have the opportunity to spend a period abroad at a European Institution with which has signed a *PhD level Erasmus agreement*, without additional taxes at the host site. They can also receive an additional economic support, if selected after applying to a competitive call. A similar opportunity for the Candidate is the *Erasmus⁺ Traineeship* that allows students to carry out an internship abroad in a company. More information will come as available in the [PhD School site](#) and in the [Career Service site](#).

The Politecnico di Milano is also always keen to collaborate with other researchers and experts also for the supervision activities, the management and the final evaluation of a PhD Candidate. Other experts may be added to the supervision team and two universities may organize a [Joint or a Double Degree](#)⁶ (issued by two joint PhD programs or even two separate ones), with an agreement to be approved by the Board, the PhD School and the other Institutions involved.

Further information can be found on the PhD School and PhD programme websites.

8.2 ABC PhD OPENTalks

ABCPhD OPENTalks, started in 2016. It is a series of meetings that ABC professors and researcher, if possible with the help of a PhD Candidate (or a "just-doctor"), organize to take to ABC-PhD other researchers, from other foreign or Italian research institutions, from other departments of Politecnico di Milano or even in our department.

PhD Candidates are invited to propose the organization of OPENTalks, with the help of their Supervisors, either to take the occasion of experts visiting the Department or other close institutions, or to enhance their review.

⁶ <http://www.dottorato.polimi.it/en/looking-for-a-phd/international-programmes/double-and-joint-phd/index.html>

9. Other rules

9.1 Publication policy⁷

The 4th Article of Politecnico di Milano's Statute encourages full and open access to knowledge, promoting the free circulation and the widest possible dissemination, also in digital format, of teaching, cultural and organizational contents. In addition, the Politecnico di Milano has signed Messina Declaration, transposing the *Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities*⁸. This policy allows users to make available their own scientific products in open access mode through the [institutional repository "Re.Public" \(IRIS\)](#). This repository enhances visibility of the scientific activity of each Researcher and makes valuable and valued the Politecnico di Milano of scientific activity for users, partners and customers, enhancing this way its reputation.

PhD Candidates are requested to deposit the work at Politecnico di Milano (in the online catalog UGOV) and encouraged to give consent to its visibility. It will automatically be transferred into the institutional repository and made visible to anyone who looks for.

About publication, each PhD Candidate is supposed to publish a minimum number of papers according to the rules established at paragraph 6.1.3.

9.2 Ethical issues

This PhD Programme wants to contribute to develop a culture of institutional integrity and moral responsibility. PhD Candidates are requested to adhere to the recognized ethical practices and fundamental principles defined in National, Regional and University's Ethical Codes.

Candidates are accountable towards their funders, if any, and for the efficient use of taxpayers' money, if their scholarship is funded by public funds. In any case, they are accountable towards society as a whole, for which their research work must be relevant, and their products must not simply duplicate research previously carried out elsewhere.

In compliance with their contractual arrangements, PhD Candidates must disseminate and exploit, also commercially, or make accessible to the public (or both) whenever the opportunity arises, communicating and transferring them, also into other research settings.

They must avoid **plagiarism** of any kind, respect regulations about **Intellectual Property Rights**, joint **data ownership** in the case of research carried out in collaboration with other researchers, and the requirements and conditions of any sponsor or funder, independently of the nature of their contract. Researchers should adhere to these regulations by delivering the required results (e.g., thesis, publications, patents, reports, new products development, etc.) as set out in the terms and conditions of the contract or equivalent document. They must **validate new observations** by showing that experiments are **reproducible**. Methods of collection and analysis, the outputs and, where applicable, details of the data should be open to internal and external scrutiny, whenever necessary and as requested by the appropriate authorities.

Researchers should at all times adopt **safe working practices**, in line with national legislation, including taking the necessary precautions for health and safety and for recovery from information technology disasters, e.g., by preparing proper back-up strategies and by using tools for defending against network informatic attacks.

⁷ The text is a short synthesis of Politecnico di Milano's policy, you can find [here](#).

⁸ Open access aims the full, free availability of scientific literature, on the internet and no (financial, legal or technical) barriers to its diffusion, except those associated with the access to the web. The publication of "Berlin Declaration" is dated 22 October 2003 and you can find the original version in the Max Planck site (The Max Planck Society is one of the founders of the international Open Access movement) the linked English [page](#).

If a PhD Candidate loses her/his data, the damage will not only involve her/himself, but will be extended to the ABC Department. Consequently, if the PhD Candidate has not taken all reasonable measure to prevent the data loss, she/he may be asked to compensate for it, with consequent impact on the EoY Evaluation (up to possible disciplinary procedures).

They should also be familiar with the current national legal requirements regarding data protection and confidentiality protection requirements and undertake the necessary steps to fulfil them at all times.

More in general, also Candidates (as everyone else) has the responsibility to help to ensure a positive work environment, in which the respect of personal dignity and integrity is ensured, the value of diversity recognized and intimidating, hostile or humiliating climate is discouraged and bullying prevented.

The ABC-PhD programme promotes and support PhD Candidates social and community making activities.

9.3 Intellectual Property Management and Technology Transfer

The Politecnico di Milano, in addition to the development of scientific knowledge, has, among its objectives the enhancement and the valuation of the results of scientific research and the scientific and technological transfer. With this purpose, it promotes creativity and intellectual property of PhD Candidates, as well as of other researchers, students, fellows and contractors, and supports them in the economic exploitation of their ideas.

In accordance with current regulations, when PhD Candidates – as well as any other employee or student – develop an invention during their institutional activity or during independent research activities developed using equipment and facilities of Politecnico, during research activities funded or co-funded by third parties who do not exploit directly or indirectly the results, the Politecnico di Milano is the owner of the economic rights and the protection of the invention is to be considered a duty of all parties, with the help of the competent office for the valorization of Research (TTO - *Technology Transfer Office*), that must be informed as soon as possible. If the PhD Candidate realizes the invention independently, he is also owner of the economic rights, but he/she should always ask Politecnico di Milano to acquire relevant rights.

The details of the rights and duties of the parties are defined in the Regulations on industrial property of the University.

9.4 Candidate's Document Management

Every document representing the activity of the PhD Candidate as student and early-stage researcher of Politecnico di Milano must be made available to the *ABC-PhD Programme Board* members, at least for the annual evaluation, using the following naming rule:

MILESTONE DOCUMENTS:

SURNAME NAME NN title of the document (i.e., *ROSSI PAOLO 03 Position Report* or *ROSSI 03 notes*)

OTHER DOCUMENTS (papers, reports, course products):

SURNAME NAME YYYY title of the document (i.e.: *ROSSI PAOLO 2015 Love in the Romantic Literature*)

NN = progressive number of the milestone

YYYY = year of the document

All documents will be uploaded in the Candidate's personal area.

Attachment A1 – ABC-PhD Programme Board (Collegio dei Docenti)

1. [Marco Scaioni](#) - *Head of ABC-PhD*
(Surveying and mapping - ICAR/06)
2. [Andrea Antonio Caragliu](#) - *Deputy Head and Delegate for ABC-PhD Training Programme*
(Applied Economics - SECS-P/06)




3. [Oscar Eugenio Bellini](#)
(Architecture Technology - ICAR/12)
4. [Francesca Claudia Maria Belloni](#) - *Delegate for Milestones Organization*
(Architectural and urban design - ICAR/14)
5. [Elisa Boeri](#) - *Delegate for ABC-PhD Training Programme*
(History of architecture - ICAR/18)
6. [Francesca Bonfante](#)
(Architectural and urban design – ICAR/14)
7. [Maddalena Buffoli](#)
(Hygiene and public health - MED/42)
8. [Paola Caputo](#)
(Building physics and building energy systems – ING-IND/11)
9. [Valter Carvelli](#)
(Structural Mechanics – ICAR/08)
10. [Sara Cattaneo](#)
(Structural engineering - ICAR/09)
11. [Pierluigi Colombi](#)
(Structural Mechanics – ICAR/08)
12. [Tommaso D'Antino](#)
(Structural engineering - ICAR/09)
13. [Laura Daglio](#)- *Delegate for Web Communication*
(Architecture Technology - ICAR/12)
14. [Claudio Del Pero](#) - *Delegate for Milestones Organization*
(Building physics and building energy systems – ING-IND/11)
15. [Stefano Della Torre](#)
(Conservation and restoration of architecture - ICAR/19)
16. [Maria Pompeiana Iarossi](#) - *Delegate for promoting integrative activities of the PhD Candidates*
(Representation of architecture - ICAR/17)
17. [Monica Lavagna](#)
(Architecture Technology - ICAR/12)
18. [Laura Elisabetta Malighetti](#)
(Architectural engineering - ICAR/10)

19. [Elvio Manganaro](#)
(Architectural and urban design - ICAR/14)
20. [Marzia Morena](#)
(Architecture Technology - ICAR/12)
21. [Laura Anna Pezzetti](#)
(Architectural and urban design – ICAR/14)
22. [Fulvio Re Cecconi](#)
(Building Production - ICAR/11)
23. [Corinna Rossi](#) - ***Delegate for Milestones Organization***
(Egyptology and coptic civilization – L-OR/02)
24. [Matteo Ruta](#)
(Building Production - ICAR/11)
25. [Graziano Salvalai](#)
(Architectural engineering - ICAR/10)
26. [Leopoldo Sdino](#)
(Real estate appraisal - ICAR/22)
27. [Andrea Tartaglia](#) - ***Delegate for promoting integrative activities of the PhD Candidates***
(Architecture Technology - ICAR/12)
28. [Marco Vincenzo Valente](#)
(Structural engineering - ICAR/09)

Attachment A2 – ABC-PhD Advisory Board

The *Advisory Board* is consulted – as matter of principle – at the end of every year, for a qualitative assessment of the PhD Programme, for an independent assessment of the results of the Candidates of each cycle, and to receive suggestions for the improvement of its relationship with the society.

The following highly referenced experts are the members of the *ABC-PhD Advisory Board*.

	<p>Teresa BAGNOLI is graduated in <i>Scienze Politiche Internazionali</i>, specialized in <i>Industrial Policy and local development</i> @LSE and Project Management (1995). She is managing director of the area <i>Building and Constructions Strategic Development</i> of ASTER and Coordinator of the Emilia-Romagna 's Construction Platform of High Technology Network, with a long experience of project manager of R&D projects in different areas.</p>
	<p>Alessandra FAGGIAN is Professor of Applied Economics, Director of Social Sciences and Vice Provost for Research at the international PhD school Gran Sasso Science Institute, L'Aquila, Italy. Moss Madden Memorial Medal (2007) and Geoffrey Hewings Award (2015) she is also President of the North American Regional Science Council (NARSC) and co-editor of the journal Papers in Regional Science with Roberta Capello. In a recent ranking of the top 100 regional scientists in the world (Rickman and Winters, 2016), she was ranked 19th.</p>
	<p>Mary MCNAMARA, fellow of the Royal Society of Chemistry and an active researcher in the development of novel drug delivery systems, is Head of the Graduate Research School at Dublin Institute of Technology (the largest provider of higher education in Ireland) and former member (2012-2018) of the steering committee of the Council of Doctoral Education of the European Universities Association (EUA CDE). She is also member of the Irish National Forum on Research Integrity and of the National Advisory Forum for Ireland's National Framework for Doctoral Education.</p>



Catherine MAUMI, Architect, Doctor (EHESS), HDR (Paris 8) is full Professor (tenure) of **History and theories of architecture and urban forms** at the [Ecole nationale supérieure d'architecture of Grenoble](#). She is the scientific director of the "[Laboratoire de recherche Les Métiers de l'Histoire de l'Architecture, édifices-villes-territoires](#)" (MHAevt) and Doctoral supervisor of the *Doctoral School 454: Sciences de l'Homme, du Politique, du territoire*, University Grenoble Alpes.



Agnes WEILANDT (MSc in structural engineering @RWTH Aachen and PhD at the Technical University Stuttgart) is project manager at [Bollinger + Grohmann Ingenieure](#) since March 2006, involved in many national and international projects, and Professor for structural analysis and construction engineering at the [University of Applied Science in Frankfurt](#), since 2010. Before and also during her time at the Technical University Stuttgart, Agnes Weilandt worked with Werner Sobek Ingenieure in Stuttgart.

Attachment A3 – Figures and responsibilities of ABC-PhD Programme

1. The PhD Candidate

Admitted *Applicants*, once evaluated, accepted, completed the administrative procedures and registered, become *PhD Candidates* and **carry out full time study and research for three years** (four years in the case of “executive” or double-degree programmes).

Candidates are expected to have a proactive approach: in planning and reviewing their research activities with their *Supervisors*, in their interaction with their *Tutor* and with their colleagues.

2. The ABC-PhD Programme Board

The *ABC-PhD Programme Board* (see *Attachment A1*) is currently composed of 28 members from ABC Department. This number may slightly change, including also professors from other research Institutions. The *Board* and its *Head* are the governing bodies of the *Programme*:

- The *Board* defines the *Educational Plan* of the PhD programme and is responsible, also from an administrative point-of-view, for the management and execution of every teaching and cultural activity related to it (lessons, seminars, Milestones, project workshops, laboratories and similar). The *Board* is also responsible for ensuring the widest possible publicity about its activities, within the scientific community, in order to gain the widest confrontation and sharing;
- The *Board* proposes to the Rector the commissions appointed with the comparative assessment of the candidates for the *Access to PhD programmes* and the Examining Boards for the Final Exams and the award of the PhD title;
- Moreover, the *Board* appoints the *Supervisor* of her/his *PhD Thesis* (and authorizes, if requested, the use of a language other than Italian or English) and it approves the proposed *Research Topic*, the title of the *PhD thesis* and the *PhD Agreement* that will describe how the Candidate will develop it; and
- Eventually, the *Board* authorizes and recognizes the research and teaching activities of the PhD Candidate in other universities, summer schools and cultural institutions and, at the end of each year, assesses PhD Candidate’s activity, commitment and results, in order to decide whether he/she may continue on to the next academic year or to the final examination, if the PhD Candidate attended the last regular year. The Board, if suggested by the Tutor, may nevertheless review and assess the activity of a Candidate in any moment of the year.

3. The Head of the ABC-PhD Programme

The *Board* selects a coordinator (Head of the Board), in Conformity with Politecnico di Milano’s Regulations, in charge of the programme management, supported by the *ABC-PhD Office*. She/he represents the Programme in the PhD School Council and, in agreement with the Department, organises the educational and cultural activities of the project.

4. The Tutor

The PhD Candidate’s *Tutor* is chosen among the members of the ABC-PhD Programme Board, with the double goal of proximity of research topics with the potential candidate and independence from the PhD Candidate’s Supervisor. The Tutor has the assignments to be a friendly point-of-reference for the Candidate to help her/him dealing with problems related to research, training and relationships with others in the university. If requested, needed and opportune, the *PhD Programme Board* may change the *Tutor* and assign tutorship responsibility to another *Member*.

In the case a Tutor ends her/his appointment as member of the *Board*, the position should be replaced by another effective member of the *Board*. Exception to this rule may be made when the tutored candidate has already completed the basic three years (or four years in the case of “executive” or double-degree programmes).

5. The Supervisor

Supervisors are responsible to the *ABC-PhD Programme Board* for ensuring that the PhD Candidates’ thesis work is performed and that they commit to comply with the directives of the *Board* and their PhD Training Programme.

They are expected to act as mentors, imparting wisdom and the best principles and sharing knowledge with the PhD Candidate. They support their PhD Candidates in the development of their personal skills and research expertise, encourage the PhD Candidate to attend specific Courses and to take part in selected *Research Activities*. Moreover, they push their PhD Candidates to find an early confrontation about their research results, i.e., publishing their work or taking part in peer-reviewed international conferences, and to enforce networking with other PhD Candidates and other researchers, in particular at an international level. The *Supervisor* is a specialist in *PhD Candidate’s Research Topic*, may not be a member of the *Board* and may belong to other Institutions than Politecnico di Milano. One or more *co-Supervisors* may be appointed, to support the *Supervisor* with specific competencies and expertise. They commit to complying with the directives of the *Board* and the Regulations of the *PhD Programme*.

Supervisors and *co-Supervisors* are expected to practice a continuous monitoring activity on their Candidates’ work, in order to understand if their plan is followed, if it is to be modified, accelerated or slowed.

At the end of each year, the *Supervisor* screens the quality of the EoY output of the Candidate and of her/his whole activity and proficiency. To this aim, the *Supervisor* makes a formal *evaluation proposal* to be presented to the MS Committee.

If requested, needed and opportune, the *ABC-PhD Programme Board* may change the *Supervisor* and assign this responsibility to another *expert*.

6. The Evaluation Committee

The *Board* may delegate to an *Evaluation Committee*, that will include at least two members from the *Board*, the task of assessing Candidates during Evaluation Milestones. The Evaluation Committee will report to the *Board* the results of its assessment, starting from the *evaluation proposal* of their Supervisors.

7. The Final Exam Committee

The *Final Exam Committee* is composed of at least three experts, two of which, at least, are “external assessors”, i.e., not part of the ABC Department and, possibly, not a member of the university teaching staff.

8. The ABC-PhD Office

The PhD Office, organized by the ABC Department, supports the organization of all the activities of the PhD programme.

9. The Candidates’ representative

Following the ABC Department Regulation, Candidates have one official representative in the Department Council. Candidates may autonomously elect one or more representatives, i.e., per each Cycle, in order to discuss teaching problems with and to be consulted by the *ABC-PhD Programme Board* and the *Head of the Programme*.

10. **The PhD Agreement**

The PhD Candidate details and plans her/his activity in the *PhD Agreement* (which takes over the *Research & Training Plan* due up until the 37th Cycle). It gives evidence of every educational activities that has been planned to let the PhD Candidate reach adequate proficiency in her/his field, master the chosen Research Topic, develop a research-oriented mind-set and a strong communication ability, and realize that significant original research contribution to the knowledge that will be implemented in the PhD Thesis.

The *PhD Agreement* should be prepared by each Candidate during the first year and submitted by the deadline communicated after the beginning of the programme.

11. **The Doctoral Courses**

A *Course* is a structured teaching activity, with a stated *training mission* (knowledge to be acquired) and a final *learning assessment*. It may focus on *basic issues* (problems, theories, methods) or on the *founding elements of a discipline*, teach specific skills and tools, report a *debate* and *cultural positions*, propose *analytical strategies* and *models*. It may be based on *lectures*, *cooperative learning activities* (laboratory experiments, design projects, group-homework assignments, etc.), *brainstorming workshops* and *discussions*, *case-study analysis* and *role playing* or other lesson plans.

A *Doctoral Course* is characterized by the aim to foster critical attitude and research mind-set and to represent the state of the art of a specific research field and the evolution of the scientific debate it produces.

The product (as homework or as classwork) requested by a Doctoral Course to PhD Candidates is, as far as possible, oriented to their PhD Thesis work or to something that could take to the redaction of a scientific paper, a conference presentation or similar.

The average 5 ECTS Doctoral Course, with a standard mix of lectures, exercises and other classwork activities, engage the student from a minimum of, about, 30 hours to a maximum of 40 hours. These limits nevertheless are not strictly mandatory and may depend on the nature of the teaching activities.

12. **The Course Catalogue**

The *Course Catalogue* is the sum of all the courses and cultural activities offered and endorsed by the PhD Program, that PhD Candidates may take advantage of, to pursue the aims of their *PhD Agreement*. On the contrary, with the term “teaching activity” we will refer to activity performed by the PhD Candidate, when authorized.

13. **The PhD Thesis**

The main objective of a PhD *Candidate* is the development of an original research contribution. This contribution will be reported in the *Candidate's* PhD Thesis, written under the guidance of the appointed *Supervisors*. The thesis may report results that the PhD Candidate has already published only if they have been obtained during her/his PhD Programme activities.

Attachment A4 – International, Industrial and Social Relations

Funders and co-supervising partners

The following list the Associations, Research Institutes and private enterprises with which the ABC-PhD Program started a relation to support a scholarship or other formal collaboration:

1. *Alubel*, an Italian company working in the field of alloy constructive systems.
2. *ANCE Energia*
3. *CNR-ITC* (Institute for Construction Technologies) a scientific facility of the *National Research Council* (CNR) operating in the civil engineering sector.
4. *Digitarca srl*, an Italian company working in the field of 3D data acquisition, modelling, visualization and fruition.
5. *European Academy of Bozen/Bolzano (EURAC)*, an applied research centre organised into four main areas of research: Autonomies, Mountains, Health and Technologies.
6. *Italcementi spa*, the Italian brand in the cement sector, now merging with HeidelbergCement.
7. *Jacobs*, chemical industry
8. *NTNU* - Norwegian University of Science and Technology
9. *CONSORZIO CIS-E - Construction Innovation and Sustainable Engineering*
10. *Comitato Officina dopo di Noi* -
11. *ENEA* - Italian National Agency for New Technologies, Energy and Sustainable Economic Development
12. *CEI* - Conferenza Episcopale Italiana
13. *WOOD BETON*
14. *DER-GOM*
15. *HILTI*
16. *BAM* - Bundesanstalt für Materialforschung und -prüfung
17. *Anthea*
18. Regione Lombardia
19. Univerlecco
20. *SUPSI* - Scuola universitaria professionale della Svizzera italiana

Other ABC-related institutions

- Associazione Rete Italiana LCA - Italian network on Life Cycle Assessment
- International Association for Shell Structures (IASS), founded by Eduardo Torroja in 1959, has as its goal the achievement of further progress through an interchange of ideas among all those interested in lightweight structural systems such as lattice, tension, membrane, and shell structures.
- Tensinet