



# Doctoral *Manual*

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This document serves as a practical guideline for doctoral candidates and their supervisors at Politecnico di Milano. The document describes the roles, the organization and the workflow associated with the supervision and training of doctoral candidates.

The document has been approved by the Academic Senate of Politecnico di Milano (resolution n. 19470 of 18/10/2021) **and has been partially revised by the PhD School Board on 14 November 2023.**

## Contents

Introduction.....	2
Doctoral supervision.....	2
The Doctoral Candidate .....	2
The Supervisor(s) .....	3
The Supervisory Team .....	4
The Tutor .....	4
Project planning and formal arrangements.....	4
The project start (months 0 – 6).....	5
The PhD Agreement.....	5
The Doctoral Education programme and the Study Plan .....	6
The research phase (months 6 – 30) .....	6
Yearly milestones with the Faculty Board .....	6
The doctoral dissertation (months 30+).....	7
The final defence (months 36+).....	7





## Introduction

Politecnico di Milano aims at stimulating the personal and professional development of doctoral candidates, in order to streamline their doctoral studies and minimise dropouts. The **Doctoral** Manual has been drawn up in consultation with our university's academic community. It builds on existing rules and regulations currently active at Politecnico di Milano, notably the Doctoral Regulations, the Italian Ministry Decree **226/2021** and the Code of Ethics and Conduct of Politecnico di Milano. The **Manual** is framed within the European Charter for Researchers. The above regulations are leading, whereas the present Manual is intended as a point of reference that should be considered by all those who are involved.

The principles and motivation of the present Manual stem from the Discussion Paper "Innovative Doctoral Training at Universities of Science and Technology", the Salzburg Principles for the Doctoral Programmes for the European Knowledge Society, and the subsequent Salzburg II Recommendations. All the aforementioned documents are available on the PhD School website. The Faculty Boards of the individual PhD programmes can draw up specific and additional measures to adapt the workflow to the local organization.

Selecting the right doctoral candidate is an important first step in a successful PhD programme. The PhD selection complies with the Human Resources Strategy for Researchers (HRS4R) principles, as acknowledged by the "HR Excellence in Research" award granted to Politecnico di Milano.

## Doctoral supervision

A successful partnership requires both doctoral candidates and their supervisors to fulfil certain roles and take the related responsibilities. As members of the Politecnico di Milano research community, both should adhere to the university's core values, which are Responsibility, Respect, Integrity, Professionalism, Fairness, Trust, and Transparency, as well as the norms generally agreed with, and shared principles of research conduct.

Doctoral candidates can expect regular advice and support from their supervisors; both reactive and proactive advice shall be given. Appropriate supervision and a readiness to grow are vital to the successful completion of a doctoral programme. This partnership is based on (scientific) integrity and mutual respect, which are beneficial to the research and careers of both the doctoral candidates and their supervisors.

## The Doctoral Candidate

Doctoral candidates are the most important actors in the PhD process. They are expected:

- TO PUT FORWARD innovative research and show ownership of the design, organization and execution of the research work;
- TO DELIVER agreed work packages on time;
- TO CONDUCT the research with care and in line with the professional academic standard of the field. Reporting must be complete and clear, and results must be appropriately documented. Research data must be well managed and shared according to the requirements suggested by Politecnico di Milano in the Code of Ethics and Conduct, and the funding parties of the research;
- TO STUDY the relevant work of others;



- TO PROPERLY acknowledge this foreground work and NEVER present work done by others as one's own work;
- TO CONDUCT research and disseminate results in accordance with all applicable codes and regulations, including those regarding, e.g., experiments with humans and animals, hazardous materials and substances, and (if any) agreements made with the funding parties of the research;
- TO AGREE with their supervisory team the publication and dissemination of the research results related to their PhD thesis. To this aim, written agreement must be obtained (an email is considered appropriate) from a member of the supervisory team before submitting the results for possible publication or dissemination in journals and/or conferences. Candidates who do not receive a reply to their publication/dissemination requests within 1 month may address their demand to the Head (Coordinator) of the PhD programme, who will provide prompt feedback;
- TO UPLOAD (or to ascertain that a coauthor uploads) on the Politecnico di Milano database (presently, the IRIS platform) all the papers published during the PhD career, and to be compliant with the Politecnico di Milano policy on open access
- TO WRITE a dissertation that shows the candidate's ability to conduct independent and original scientific research (not biased towards an outcome in the interest of any funding party), to master their research topic, and to discuss further research lines and/or applications;
- TO CONTACT the tutor or the PhD programme Head if difficulties occur in the relationship with the supervisor and seek professional assistance in the event of personal problems. For the same issues, and for others related to any serious professional or personal aspect arising during the doctoral studies, the candidates may refer to the Students' Advocate (*Difensore degli Studenti*), who will interact with the appropriate institutional bodies while ensuring privacy and discretion.
- TO REQUEST prior authorisation to the Faculty Board before undertaking any professional activity not envisaged by their Programme Plan. The authorisation will be secured upon ascertainment that such activities do not conflict with the good outcome of the doctoral programme.

## The Supervisor(s)

The supervisors are expected:

- TO MAKE sure that there is a commitment to provide the candidate with an adequate supervisory team for the entire duration of the PhD career (at least 3 years);
- TO STIMULATE and support the doctoral candidates in conducting their research and to guide them towards becoming independent junior researchers;
- TO HELP the candidates develop a critical mindset, be able to handle critical comments, and enact effective scientific communication;
- TO PROVIDE feedback and assist the candidates at regular meetings (at least once a month) to define short- and medium-term goals, to reflect on the progress of the workplan, and to help define their doctoral training and research path;
- TO INFORM in advance (or as soon as possible) the candidates whether Non-Disclosure Agreements apply on the research to be conducted and/or whether other contractual duties apply;
- TO INTRODUCE and guide the candidates into the relevant academic and scientific communities;
- TO STAY up to date with Politecnico di Milano policies with regard to doctoral supervision, regulations and quality assessment;



- TO HELP monitor the research and work progress;
- TO AIM for completion of the (draft) dissertations within the expected time frame;
- TO CONTACT the tutor or the Head of the PhD programme about non-conformity issues and concerns.

## The Supervisory Team

The doctoral candidate is supported by a supervisory team consisting of the supervisor, and possibly one or more additional members.

The supervisor is responsible for the proper guidance given by each supervisory team member, who should be an expert in the field of research and have experience with coaching doctoral candidates or students.

The supervisory team members (possibly, but not necessarily, co-supervisors) may also be post-docs or junior faculty members of the research group. They support and guide the candidate in the day-by-day research part, in agreement with the research plan drafted by the supervisor.

Team members may be affiliated with academic or non-academic organizations different from Politecnico di Milano. At least one member of the supervisory team is a faculty member of Politecnico di Milano.<sup>1</sup>

## The Tutor

Every doctoral candidate is assigned a tutor belonging to the Faculty Board of the PhD programme. Tutors should belong to a different research group than that of the supervisor. They support and advise the doctoral candidate on issues related to the organization and planning of research and doctoral education.

Tutors can anticipate possible bottlenecks and, if necessary, refer the doctoral candidate to the relevant colleagues in the organization. In the unfortunate case that doctoral candidates experience doubts or problems regarding the progress of their Doctoral Programme, tutors refer the candidates to the Head of the PhD programme, who has the responsibility to inquire into the interpersonal relations with the supervisor and supervisory team, and put forward possible solutions.

The doctoral candidate and tutor meet at least once a year, though more frequent periodic meetings are encouraged.

## Project planning and formal arrangements

Different procedures and associated workflows and formalities apply to different phases of the doctoral trajectory.

Three main phases are identified: the introductory phase, the research phase, and the preparation of the dissertation and defence phase. Formal requirements are laid down in the Politecnico di Milano Doctoral Regulations and the Italian Ministry Decree **226/2021**.

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<sup>1</sup> Particular cases in which the entire supervisory team is external to Politecnico di Milano must be explicitly approved by the PhD Programme Faculty Board.



## The project start (months 0 – 6)

Once the candidate selection procedure is completed, the candidates proceed by completing their enrolment as Politecnico di Milano PhD candidates.

On behalf of the Faculty Board, **the Head of the PhD programme** sets up a *Welcome Meeting* in order to introduce the common rules which apply to all doctoral candidates, including doctoral education requirements, availability of research funds, and information on office space. In occasion of the Welcome Meeting, the present **Manual** and the related documents are presented to the incoming PhD students.

**The potential supervisor(s)** organise meetings with the doctoral candidate. Whenever the project is subject to a research agreement with third parties, they provide a comprehensive and specific project description, including the assignment and funding conditions. When thematic scholarships are offered, the requirements regarding the research topic and the research plan shall be specified in the scholarship description distributed with the call. The potential supervisors introduce the candidates to the supervisory teams. They all agree with the candidate and draft the content of the PhD Agreement Form, which is then submitted to the Faculty Board once all aspects are settled.

The supervisory team takes the cultural background of the doctoral candidate into account in setting up the proper supervision form. It is appropriate to inform the candidates, in particular those not having had a previous study or work experience in Italy, about the work-culture at Politecnico di Milano, and to discuss the expectations and critical success factors that a PhD project completed in time should possess.

**Doctoral candidates** ensure that individual formalities (registration, visa, permits, etc.) are in order, and complete the bureaucratic steps specified by the PhD School Secretary. They are expected to carry out their studies and research while explicitly complying with the Code of Ethics and Conduct and the content of the present Manual. They complete and submit the PhD Agreement Form in due time.

## The PhD Agreement

**The PhD agreement** is a comprehensive project plan and framework for the doctoral career. The PhD Agreement is submitted through the online services as soon as possible, and in all cases within the first PhD year. It becomes effective once approved by the Faculty Board of the PhD programme.

The agreements are made between the doctoral candidate and the supervisor(s). The form includes a research description and plan, a description of the supervisory team, a preliminary agreement on the courses the candidate is expected to attend, and a preliminary agreement on the teaching activities the candidate is allowed/required to conduct. If the project receives external funding, the agreements made with the funding body must be mentioned in the research plan. In general, doctoral candidates can expect to be asked to spend about 10 to 15% of their time on educational or other activities not directly related to their own project. The time plan of these activities should be envisioned in such a manner that the resulting delay in the research progress of the PhD candidate is minimised.

If/when needed, the PhD Agreement can be modified/updated. When this is the case, a new Agreement is filled in and submitted, and it is subject to a new approval by the Faculty Board of the PhD Programme. Whenever the modification of the **PhD** Agreement requires a new supervisor to be identified, the Head of the PhD programme assists the candidate in identifying a new guidance and, if a new supervisor cannot be identified, takes personally care of guiding the candidate's research.



When a modification of the **PhD** Agreement is requested in the presence of a thematic scholarship, the Faculty Board must assess whether the new Agreement complies with the requests specified in the description of the scholarship. In case the Agreement is found not to be compliant with the scholarship description, the Faculty Board can suspend the thematic scholarship, taking also into account the opinion of the supervisor and of the company possibly funding the scholarship.

### The Doctoral Education programme and the Study Plan

Each doctoral candidate is expected to attend a certain number of courses and take some exams at Politecnico di Milano (or external partners whenever authorised).

The PhD School of Politecnico di Milano offers courses and educational activities aimed at reinforcing the PhD candidates' curricula with soft and transferable skills. Every PhD candidate is expected to earn at least 10 ECTS from courses organised by the PhD School.

Each PhD programme complements the doctoral education with discipline-related courses. The minimum number of credits that must be earned through these courses depends on the PhD programme. It is stated in the Programme Plan, and quoted in the PhD Agreement.

First-year doctoral candidates ascertain which courses are available and submit a Study Plan that is examined and approved by the Head of the PhD programme. The tutor may support the candidate in checking whether the courses chosen for the Study Plan comply with the PhD programme regulations. In the first year, the study plan can contain a number of courses which is less than the total number of required credits.

### The research phase (months 6 – 30)

Research meetings between doctoral candidates and members of the supervisory team are a crucial success factor. Formal meetings may include milestones in which the research progress is analysed, and possible modifications of the research plan are discussed. More frequent regular meetings must also be scheduled to assess the progress of the planned research.

All required courses should be completed by the end of the second year.

### Yearly milestones with the Faculty Board

All PhD programmes at Politecnico di Milano organise a yearly milestone in which all PhD activities carried out by the candidates are discussed with and assessed by the Faculty Board of the PhD programme.

Before the meeting, PhD candidates are asked to submit a report of the research and educational activities conducted during the year. Presenting the research activity to the Faculty Board is a unique opportunity to train and strengthen the public communication and scientific communication skills. Possible outcomes of the yearly evaluation are:

- Go (with an A/B/C/D grade), which secures access to the next PhD year;
- Er (No Go | Repeat), which requires a repetition of the PhD year. The PhD scholarship, if any, is suspended during the repeated year, and is restored only after a "Go" result in the next yearly milestone;
- Ei (No Go | Exclusion), which ends the candidate's PhD career. Two consecutive Er (repeat) evaluations automatically determine an Ei (exclude).



Supervisors and/or PhD programme Heads provide feedback on the development status of the PhD research project. In particular, as soon as they understand that the candidates are at risk of receiving non-positive feedback (Er or Ei) in their following yearly milestones, they make this risk explicit to the candidate. If at all possible, the resulting critical feedback should be provided by email or in any written form, possibly by keeping the tutor and/or the Head in copy. The overall expectation of the PhD School is that “No Go” evaluations should not come as a surprise.

Further intermediate milestones meetings with the Faculty Board might be prescribed by the single PhD programmes.

At the end of the last year of the expected PhD duration, the Faculty Board may award an extra year to complete the PhD thesis. In case the PhD candidate is granted a scholarship, the extra year does not extend the scholarship duration. The Faculty Board may also accept a candidate’s request to submit the PhD thesis before the end of the extra year.

The PhD School promotes and encourages interaction among doctoral candidates to foster interdisciplinarity and networking during the PhD career. Such initiatives can be addressed to the PhD representatives at the PhD School Council.

Politecnico di Milano supports the career development of its PhD graduates through the Career Service. More specifically, Career Service offers a personalised programme that supports the PhD candidates in:

- finding out sectors and positions in the labour market in Italy and abroad that are most suitable to their personal ambitions and chosen PhD route;
- building an effective CV and personal statement;
- evaluating the PhD candidates’ profile to ensure the best presentation to the corporate world improving their interview technique by having a mock interview with experts.

### The doctoral dissertation (months 30+)

The doctoral dissertation is a publication that describes the candidate’s original scientific research.

The dissertation includes a clear introduction, a complete research description, and extensive discussion, reflection and prospects of the results. The thesis is pre-evaluated by the Faculty Board, which establishes the admission of the doctoral candidate to the defence. It is further assessed by two external referees following the Politecnico di Milano and national regulations. The candidate is allowed up to six months to implement modifications and improvements in the thesis, in response to the referees’ reports.

***In the writing of the doctoral dissertation, the use of artificial intelligence-based writing tools (e.g., ChatGPT) must always be explicitly disclosed and limited to correcting texts written entirely by the candidate. The use of such tools to generate wholly or partially original texts is not allowed. For this reason, the plagiarism detection process will also involve the use of tools to ensure that the dissertation has not been generated in whole or in part by artificial intelligence.***

## The final defence (months 36+)

A public defence of the thesis follows. Possible outcomes of the final discussion are: degree awarded *cum laude*; degree awarded; degree not awarded.

After a successful defence, candidates receive a degree and a Diploma Supplement, in which their doctoral activities are specified. Doctoral graduates are valued alumni of Politecnico di Milano – as a matter of fact, each Doctor represents a new, long-term extension of Politecnico di Milano academic network.

Further conditions on the doctoral dissertation and/or the public defence could be present in double/joint agreements, in case the PhD candidates enter one such path.