

UNIVERSITA' DEGLI STUDI DI PADOVA
Department of Industrial Engineering
Doctoral Program in Industrial Engineering

Guidelines for the training of PhD students

Approved by the Board of Supervisors (*Collegio Docenti*) on 17.10.2022

1. Duration of the Program and Credits

The PhD Course in Industrial Engineering has a duration of three years. The degree can be obtained having acquired at least 20 credits for training through courses and attendance of minimum six (6) seminars during the three years. The PhD student must also carry out independent and original research, culminating in writing up their PhD thesis. The publication of the results in ISI journals is strongly encouraged.

2. Courses offered by the Doctoral Program in Industrial Engineering

A **course** is defined as a class (taught in Italian or in English) with several teaching hours typically equal to or greater than 8 (eight), which could be divided into two or more days, at the end of which there is a formal exam. Courses held at other universities may be given in other languages. Classes offered as part of national or international schools or within courses organized by highly qualified Italian and foreign professional associations, as well as courses offered by other PhD schools or other institutions, may have a duration of less than 8 (eight) hours.

In accordance with the provisions of the University Regulations (*Regolamento di Ateneo per i Corsi di Dottorato di Ricerca, art.11*), before the beginning of each Academic Year the Board of Supervisors (*Collegio Docenti*) approves the **Course Plan**, which is a three-year training plan listing the courses offered to the students of the upcoming Cohort (*Ciclo*). The Course Plan includes:

- highly specialized courses held at the Department of Industrial Engineering (DII), led by members of the Board of Supervisors and taught by members of the Board of Supervisors or by external lecturers;
- highly specialized courses held at establishments other than DII and belonging to the University of Padua or to private or public entities in Italy or abroad;
- courses concerning general tools for research, such as: project management, legislation, preparation, formulation and management of national and international research projects, and the use of the English language for scientific research; such activities are usually organized and shared by multiple PhD Courses of the University, or they can be organized by the University, by Italian or foreign private entities or by highly qualified Italian or foreign professional associations.

The Course plan defines for each course: the topic, the lecturer(s), the duration (hours), the final exam method and the number of credits, which usually corresponds to ¼ of the number of hours. Selected courses, such as language courses or soft skills courses, are usually assigned 0 (zero) credits.

The Course Plan is published on the website of the Course (<https://academics.dii.unipd.it/phd/training>) and may be subject to updates throughout the year.

The Course Plan must contemplate classes corresponding to at least 40 credits in total, spreading topics of interest for the different Curricula of the PhD Course, to enable the assignment of an individual Training Plan to each student, in accordance with the research theme.

3. Seminars

A **seminar** is defined as a presentation with a limited duration (typically one or few hours), with no formal exam, on subjects of highly specialized and advanced research (of scientific-technical content or related to soft skills). Seminars are usually given by researchers belonging to the University, to other Italian or foreign universities, Italian or foreign research centers, to Italian or foreign private entities or given by personnel belonging to highly qualified Italian or foreign professional associations.

Seminars are proposed to the students by either the Secretariat of the PhD Course or the Secretariat of DII, through e-mails which are usually sent a few days before the event.

The PhD student may attend seminars that are not proposed by the PhD Course or by DII, subject to prior approval from the Supervisor. However, each student must attend at least 3 (three) seminars from the ones proposed by the PhD Course or by DII.

Taking part in relevant events may be considered equivalent to no more than 1 (one) seminar attendance for each event (example: attending several plenary lectures at the same International Conference is equivalent -if approved- to no more than one seminar). Conference attendance cannot be considered as a seminar.

4. The Training Plan of the Ph.D. student

The **Training Plan** (*Progetto formativo*) is a document specific to each PhD student, which defines the research theme to be pursued, a breakdown of the research activities, the courses to be attended and the name of the Supervisor and of the Co-Supervisor(s).

In accordance with the University Regulations (*Regolamento di Ateneo per i Corsi di Dottorato di Ricerca, art.11*), the Training Plan is approved by the Board of Supervisors within the 4th month since the beginning of the PhD Course, based on the proposal made by the student in synergy with their Supervisor. The Training Plan is updated and approved by the Board of Supervisors each year.

The Training Plan must include courses corresponding to at least 15 (fifteen) credits within the first two years and to at least 20 (twenty) credits by the end of the third year.

It is preferable that the Training Plan includes a series of courses and seminars aiming to acquire the plurality of multi-disciplinary competences that the PhD Course can provide, with the goal of developing analytical and synthesis skills based on interdisciplinary criteria.

The Training Plan of the student may comprise courses not included in the Course Plan of the PhD Course. The Training Plan may include courses (or parts thereof) made available in Master programs offered by the University or other universities that have not been included in the previous education curriculum of the student and are necessary for its training. Courses offered in an undergraduate program (*Laurea*) cannot be included in the Training Plan.

It is highly recommended that each student spends some time in a foreign institution during their studies (in agreement with the *Regolamento di Ateneo per i Corsi di Dottorato di Ricerca art.11, 21 and 22*).

5. Certification and Attribution of Credits

All courses included in the Training Plan must include a final exam. For the student to acquire **credits**, the exam must be passed, i.e., the sole attendance of courses and other educational activities is not eligible for credit.

As per the courses held within the PhD Course, the student must enroll in the course via Moodle platform. At the end of each course, the student is required to complete an evaluation form of the teaching activity. Participation in at least 2/3 of the lessons is required. The language of instruction is English. Exam procedures and assignment of credits are defined in the Course Plan.

To register the exam, the signature of the lecturer(s) is required. For courses held by more than one lecturer outside the PhD Course, in case of difficulties in retrieving the lecturers' signatures to register the exam, the PhD secretariat can register the exam based on the records provided by the lecturers.

In the case of courses offered by other Italian or foreign universities, the student must confirm their presence at the courses and exam session using the form provided on the website of the PhD Course, which must be signed by the lecturer (or any other person in charge for the course). The PhD student must ask the lecturer about the procedure for taking the final exam. The assignment of credits must be approved by the Board of Supervisors/Executive Board (*Consiglio Direttivo*) and can be of up to 1 (one) credit for every 4 (four) hours of class.

A student can get a maximum of 12 (twelve) credits by attending courses included in Master of Science programs (*Laurea Magistrale*). The number of credits assigned for passing the exam is equal to that attributed to the courses in the academic program (*Manifesto degli Studi*).

A student can get a maximum of 12 (twelve) credits by attending one or more national or international schools (e.g., summer schools). The assignment of credits must be approved by the Board of Supervisors/Executive Board and can be of up to 1 (one) credit for every 4 (four) hours of class.

As per the courses organized by highly qualified Italian or foreign professional associations, the assignment of credits must be approved by the Board of Supervisors/Executive Board and can be of up to 1 (one) credit for every 6 (six) hours of class.

As per the training activities not included in the Course Plan, if the course/school does not include a final exam, the Supervisor (or a professor belonging to Board of Supervisors, indicated by the Coordinator) will carry out the evaluation of the student in the most appropriate form.

All training activities which the student attends without prior inclusion in the Training Plan are subject to approval by the Executive Board during the next annual evaluation¹. The number of credits eventually assigned to the students for these activities depend on the resolution of the Executive Board. Training activities that do not result in awarded credits include:

- participation in conferences and meetings;
- courses on soft skills;
- language courses.

Special cases will be dealt with by the Board of Supervisors.

As per the seminars, the student must confirm their presence at the seminars using the form provided (if it is impossible to have the form signed by the presenter/organizer of the seminar, the Supervisor may sign the form instead).

6. Criteria and timing of PhD Students Evaluation

Doctoral student **assessment** takes place every year: at the end of the first and second year, for allowing the admission to the following year; at the end of the third year to admit the student to the thesis defense that allows to obtain the title of Doctor of Philosophy. The procedures for assessing the work of the students are established by the Executive Board of the PhD Course. Admission to the second and third years, as well as admission to the thesis defense, are approved by the Executive Board (*Regolamento di Ateneo per i Corsi di Dottorato di Ricerca, art.22*).

In the evaluation of admission to the second and third year, the profit with which the student has been attending the PhD Course, their learning and utilizing scientific research methods will be considered. The evaluation will take into account the resourcefulness and diligence demonstrated by the student in seizing the education and research opportunities offered respectively by the Course Plan, by the research facilities of the PhD Course and by the training/research experience conducted abroad. The evaluation will highlight, besides the methodological rigor, the originality and innovativeness of the results, in addition to the quality of the scientific publications.

In the evaluation of admission to the thesis defense, in addition to the above-mentioned criteria the scientific value of the doctoral thesis will be evaluated, considering its degree of originality, innovation and completeness of the results and approach as well as the possible industrial relevance of the results achieved. Together with the scientific knowledge acquired by the student, the assessment will indicate the level of skills acquired and the ability to manage human and physical resources in conducting research projects.

¹ Any addition to, or modification of the Training Plan must be evaluated very carefully by the student, prior discussion with the Supervisor. Students are strongly encouraged to ask the Contact person of the Curriculum (*Referente di Curriculum*) to seek advice in such cases, especially when the additional courses are not included in the Course Plan.

To be assessed and admitted to the following year/thesis defense, each PhD student must submit a written report (**annual report**) and give a **presentation** on a yearly basis and must submit a **final report** at the end of the third year. The assessment deadlines are summarized below:

- 1) in the last part of the first year: submit the *annual report* about the research and training activities carried out during the first year; give a presentation on issues pertaining to ongoing research;
- 2) in the last part of the second year: submit the *annual report* about the research and training activities carried out during the second year; give a presentation on issues pertaining to ongoing research;
- 3) in the last part of the third year: submit the *annual report* about the research and training activities carried out during the third year; give a presentation on issues pertaining to ongoing research;
- 4) at the end of the PhD: submit the *final report* about the research and training activities carried out during the whole PhD.

For PhD students enrolling in October, “in the last part of the ... year” means “by the end of August”. For careers starting in different months or that have been suspended for certain reasons, different evaluation timelines may be envisaged. The appropriate deadlines will be communicated by the PhD secretariat by e-mail.

“At the end of the PhD” means at the end of the third year, plus any extension or suspension of the career. The appropriate deadline will be communicated by the PhD secretariat by e-mail.

Both the annual reports and the final report are evaluated by the Executive Board, which approves admission to the following year/thesis defense (*Regolamento di Ateneo per i Corsi di Dottorato di Ricerca, art.22*).

Annual presentations are given to a panel of three members, including the Contact person of the Curriculum (*Referente di Curriculum*) and two members of the Board of Supervisors. A presentation is assessed via the following criteria:

- methodological rigor (questionable / fair / good / very good / excellent)
- significance of results (questionable / fair / good / very good / excellent)
- quality of the presentation (questionable / fair / good / very good / excellent)

For PhD students enrolled from the XXXVII cohort onward, a short **video** must also be submitted each year, summarizing the activities carried out. The video will be assessed by the panel.

7. External activities

Each PhD student may be authorized by the Executive Committee to carry out **external activities** in accordance with the applicable law (*DM 226/2021*). Each external activity must be distinctive and consistent with respect to the activities carried out by the student within the PhD Course.

The following yearly limits apply:

- up to 40 hours of teaching activities (*Didattica integrativa*);
- up to 160 hours of activities carried out within Departments of the University (e.g., Tutor Junior, Teaching-related projects, etc.);
- up to 80 hours of other activities.

Each external activity must be authorized in advance.

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