

**UNIVERSITA' DEGLI STUDI DI PADOVA**  
PhD School in Industrial Engineering

**Guidelines for the training of PhD students**

(Approved at the meeting of the Board of Supervisors (*Collegio Docenti*) of 10.9.2019)

**1. Duration of the Course and Credits**

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

**2. The Training Project**

The Training Project Plan of the School includes the courses offered by the school (*Piano dell'Offerta Formativa*) as well as the criteria for the evaluation of the activities of the students.

In accordance with the Regulations of the University (Regolamento di Ateneo per i Corsi di Dottorato di Ricerca, art.13), the Training Project is formulated by the Board of Supervisors (*Collegio Docenti*) which, in this context, compiles the calendar of training activities.

**3. The List of Offered Courses**

The List of Offered Courses (*Piano dell'Offerta Formativa*) of the School includes:

- highly specialized courses organized at the School, led by members of the Board of Supervisors of the School (*Collegio Docenti*) and taught by members of the Board of Supervisors of the School or by external lecturers;
- highly specialized courses held at establishments other than the School and belonging to the University of Padua or to private or public entities in Italy or abroad;
- courses concerning general or basic 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. This activity can be organized and shared by multiple PhD Schools of the University, or it can be organized by the University.
- seminars on subjects of highly specialized and advanced research (of scientific-technical content or related to soft skills), 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.

A course is defined as a class (taught in Italian or in English) with a number of teaching hours typically equal to or greater than 8 (eight), divided into two or more separate days, at the end of which there is a formal exam. Courses held at other universities may be given in other languages. The 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.

A seminar is defined as a presentation with a limited duration (typically one hour), after which no formal exam is given.

In accordance with the provisions of the Regulations of the University (Regolamento di Ateneo per i Corsi di Dottorato di Ricerca, art.13), the Board of Supervisors defines the List of Offered Courses of the School on the basis of proposals from its components.

The List of Offered Courses is, as a rule, defined at the beginning of each year, published on the website of the School and is updated and supplemented throughout the year.

The List of Offered Courses must contemplate a number of classes corresponding to at least 40 credits in total, divided among topics of interest for the different curricula of the PhD school, in order to enable the students to make a choice based on their specific needs or scientific interests.

There are no compulsory courses that a doctoral student must take, and the student can then independently create, in agreement with his supervisor, his own Individual Training Plan, which must be approved by the Board of Supervisors (*Collegio Docenti*).

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

The Plan is specific to each student. In accordance with the Regulations of the University (Regolamento di Ateneo per i Corsi di Dottorato di Ricerca, art.13), the Plan is approved at the beginning of each year by the Board of Supervisors and incorporates the proposals made by the student in synergy with his supervisor.

The Training Plan must include the furthering and advancing of the scientific knowledge of the student, through the attendance to highly specialized courses or courses dealing with general or basic tools for research proposed in the List of Offered Courses of the School.

The Training Plan of the student can include courses (or parts thereof) made available in PhD 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 plan. The Training Plan may include non-college learning activities and activities not necessarily included in the List of Offered Courses of the School.

In defining the Training Plan, it is preferable that the student takes a series of courses aiming to acquire the plurality of multi-disciplinary competences that the PhD School can provide, with the goal of developing in each student analytical and synthesis skills based on interdisciplinary criteria.

In order to be included in the Training Plan, each course must be approved by the Board of Supervisors.

In the Training Plan implemented by each student during the first two years of his PhD studies training activities (preferably derived from courses) corresponding to at least 15 credits must be included. It is highly recommended that each student spends some time in another institution during the course of his studies (in agreement with the Regolamento di Ateneo per i Corsi di Dottorato di Ricerca (art.13, art.21 e art.24)

#### **5. Certification and Attribution of Credits**

All activities of the Training Plan, except for the seminars, must include a final exam, and only the passing of this involves the acquisition of credits by the student. The sole frequency to the courses and other educational activities is not eligible for credit.

At the end of the course, the student is required to complete an evaluation form of the teaching activity. The student must enroll in the course via Moodle, and participation in at least 2/3 of the lessons is required. The language of instruction, for the courses offered by the doctorate course in industrial engineering, is English.

Exam procedures are defined by the teacher or coordinator of the course. When not provided, the assessment procedures are defined by the proposing Board of Supervisors.

Participation in conferences and meetings does not give right to any educational credit recognized in the Training Plan.

The allocation of credits to the courses is equal to 1 (one) credit for every 4 (four) hours of class, in the case of courses offered by the doctoral school or other schools of the university or other universities. In the case of courses included in Master of Science programs (*Laurea Magistrale*), the number of credits is equal to that attributed to them in the academic program (*Manifesto degli Studi*). Courses included in an undergraduate program (*Laurea*) cannot be assigned credits. The maximum number of credits that can be obtained taking Master's courses is 12. The allocation of credits to *soft skill* courses will be decided by the Executive Board (*Consiglio Direttivo*) on a case-by-case basis, depending on the content of the course.

Students are required to attend at least six (6) seminars during the three years. Seminars can be offered by both the PhD school in Industrial Engineering or by other graduate schools of the University of Padua or of other Italian or foreign universities, or Italian or foreign university departments. The student must confirm their presence at the seminars using the form provided. Upon completion of this educational activity, one (1) credit will be awarded.

To the certified participation in courses offered in the context of national and international schools, a number of credits equal to 1 (one) every 4 (four) hours of classroom lectures can be attributed, after the positive evaluation of the content of the school by the supervisor. If the school does not provide forms of student assessment, the student's 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. A student can get a maximum of twelve (12) credits by participating in one or more national or international schools.

To the participation in any classes offered in the context of courses organized by highly qualified Italian or foreign professional associations, a number of credits equal to 1 (one) credit for every 6 (six) hours of lessons can be attributed, after a positive evaluation of the content by the student's supervisor. If the course does not include forms of student assessment, 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.

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

## 6. Criteria for PhD Student Evaluation

Assessments on the doctoral students are given at the end of the first and second year, for allowing the continuation in the graduate studies, and at the end of the third year in order to admit the student to the exam 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 (*Consiglio Direttivo*) of the PhD program. Admission to the second and subsequent years is decided by the Executive Board (*Regolamento di Ateneo per i Corsi di Dottorato di Ricerca* (art.24)).

In the formulation of the assessment concerning the possibility of continuation in the PhD studies (admission to the second and third year) the profit with which the student has been attending the school and, in particular, his learning and utilizing scientific research methods will be taken into account. The evaluation will highlight the resourcefulness and diligence demonstrated by the student in seizing the education and research opportunities offered respectively by the Training Plan and the research facilities of the School, and in this regards the training experiences and research conducted abroad by the student will also be considered. When suitable scientific results have been achieved within the first two years of the graduate program, the evaluation will highlight, besides the methodological rigor, the originality and innovativeness of the results, in addition to the academic importance of the publications. The number of credits actually acquired by students is subject to approval at the end of each year by the Executive Board.

In formulating the evaluation for the admission to the final exam for achieving the Doctor of Philosophy degree, in addition to the above mentioned criteria for assessing the possibility to continue in the PhD studies, the scientific value of the doctoral thesis should be highlighted, taking into account its degree of originality, innovation and completeness of the results and approach as well as the possible industrial relevance of the topic and of the results achieved. Together with the scientific knowledge acquired by the student, the evaluation will indicate the level of skills acquired and experienced concerning the management of human and physical resources in conducting research projects.

Each PhD student must also submit (see the document "*Regolamento Adempimenti Fine Anno*"):

1) At the end of the first year (before the end of August), a written report on the research and training activities carried out during that year. In addition, each student must make a presentation on issues pertaining to the research that he is performing. The report will be evaluated by the Executive Board (*Regolamento di Ateneo per i Corsi di Dottorato di Ricerca* (art.24)).

2) At the end of the second year (before the end of August), a written report on the research and training activities carried out during that year. In addition, each student must make a presentation on issues pertaining to the research that he is performing. The report will be evaluated by the Executive Board (*Regolamento di Ateneo per i Corsi di Dottorato di Ricerca* (art.24)).

3) At the end of the third year (before the end of August), a written report on the research and training activities carried out during that year. In addition, each student must make a presentation on issues pertaining to the research that he has performed. The report will be evaluated by the Board of Supervisors (*Regolamento di Ateneo per i Corsi di Dottorato di Ricerca* (art.30)).

4) At the end of the third year (before the end of August), a written report on the research and training activities carried out during the 3 years of PhD. The report will be evaluated by the Board of Supervisors (Regolamento di Ateneo per i Corsi di Dottorato di Ricerca (art.30)).

\* \* \*