



**PH.D. IN PHYSICAL SCIENCES AND ENGINEERING OF INDUSTRIAL AND  
ENERGY INNOVATION (CYCLES UP TO XXXVII) AND IN PHYSICAL AND  
ENGINEERING SCIENCES FOR INNOVATION AND SUSTAINABILITY (CYCLES  
STARTING FROM XXXVIII)**

**INTERNAL REGULATIONS FOR QUALITY ASSURANCE IN THE PHD COURSE**

**Art. 1**

**Purpose**

1. The Coordinator and the Board of Professors of the Ph.D. in Physical Sciences and Engineering of Industrial and Energy Innovation (cycles up to XXXVII) and in Physical and Engineering Sciences for Innovation and Sustainability (cycles starting from XXXVIII) of the Guglielmo Marconi University pursue the promotion of the quality of the PhD Course in initial and ongoing design, in the planning and organization of training and research activities aimed at the growth of PhD students and in the continuous monitoring and improvement of activities.
2. The promotion of the quality of the PhD Course is developed in accordance with the Points of Attention proposed by the Self-Assessment, Evaluation, Accreditation - AVA3 - model of the National Agency for the Evaluation of the University and Research System - ANVUR [D.PHD.1; D.PHD.2; D.PHD.3].
3. The promotion of the quality of the PhD Programme is developed in accordance with the Standards for Quality Assurance (QA) in the European Higher Education Area (EHEA).
4. The promotion of the quality of the PhD Programme responds to the University's Strategic Objectives [University Strategic Plan 2022-2024] 1. *Develop and identify the most advanced knowledge by promoting the scientific activity of the Departments* and 5. *Interact synergistically with the world of research and society*, as part of the R4 Line of Intervention . Support research training by continuing to improve PhD policies.
5. To this end, these Regulations are aimed at defining the internal procedure of the PhD in Physical Sciences and Engineering of Industrial and Energy Innovation and in Physical and Engineering Sciences for Innovation and Sustainability of the Guglielmo Marconi University for the management of the Quality Assurance process.
6. QA activities are divided into the following three macro-categories:
  - a) Activities related to the design of the PhD Course, the planning and organization of training and research activities, the promotion of the national and international visibility of the PhD Course;
  - b) Activities related to the collection of data useful for monitoring the quality of the PhD Course;
  - c) Activities related to the monitoring and analysis of data related to the quality of the PhD and the proposal of improvement actions.

These activities respond in various ways to the three Points of Attention proposed by the AVA3 model.

These Regulations, therefore, define the procedures relating to each activity aimed at the QA of the Doctoral Course by the Coordinator, the Academic Board and the Support Offices, and provides an ordinary scheduling of the same within the calendar year.

7. In any case, the QA process is intended to be virtuously circular, since the activities of data collection and monitoring, analysis and proposal of improvement actions are aimed at the continuous pursuit of quality in the design of the Doctoral Course.

**Art. 2**



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## **Design, planning and promotion of visibility - Drafting of the training and research project**

1. The Coordinator and the Academic Board, **between the month of February and May** of each calendar year, proceed to appoint a delegate of the coordinator and the quality assurance group of the doctorate (among the members of the board) which will then propose the updating of the training and research project of the Doctoral Course downstream of the monitoring and analysis activities regulated by Articles 10-15 of these Regulations [D.PHD.3.3] which will be approved by the College by May. The training and research project is presented annually to the Ministry of University and Research (MUR) for accreditation of the new PhD cycle.
2. The training and research project represents the general educational and research objectives of the Course and takes into account the cultural and scientific evolution of the disciplinary areas of reference for the PhD cycles active within the Course, explaining the clear and articulated vision of the training course that is proposed to PhD students, both individually and collectively. The motivations for this are clarified in the training project and continuous development is pursued, on the basis of what has been obtained from the monitoring activities and consultations of the parties interested in the outgoing cultural and professional profiles [D.PHD.1.1; D.PHD.1.2].
3. The training and research project includes elements of interdisciplinarity, multidisciplinary and transdisciplinarity in the proposed training activities, in accordance with the intrinsic multidisciplinary nature of the PhD Course [D.PHD.1.4].
4. The training project creates the conditions for the autonomy of the PhD student in conceiving, designing, implementing and disseminating research and/or innovation, through adequate guidance and support from the Supervisors [D.PHD.2.3; D.PHD.2.7].
5. The training and research project allows and encourages PhD students to participate in teaching and tutoring activities within the limits of coherence and compatibility with the research activities carried out [D.PHD.2.5].
6. The training and research project promotes the strengthening of national and international scientific relations, ensuring that PhD students receive mobility periods that are consistent with the research project and of appropriate duration at qualified academic and/or industrial institutions, and at public or private, Italian or foreign research institutions [D.PHD.2.6].
7. The training project outlines the quantification of the student's commitment through the indication of the number of hours assigned to the various activities. It also clearly specifies the methods for evaluating the activities carried out by PhD students for the purposes of admission to subsequent years and to the final examination [D.PHD.1.3].

### **Art. 3**

#### **Design, planning and promotion of visibility - Preparation of the call for admission to the PhD Programme**

1. Between February and July of each calendar year, **the Coordinator (or his/her delegate), the PhD Quality Assurance Group and the Academic Board** proceed to prepare the call for admission to the PhD Course, which is structured in line with the educational objectives of the Course and with the outgoing cultural and professional profiles [D.PHD.1.3].
2. The number of places advertised takes into account the need to establish a minimum nucleus of communities of PhD students, which allows PhD students a productive comparison as part of members of a scientific community [D.PHD.2.2].
3. In addition, the number of positions advertised takes into account the number and disciplinary composition of the Academic Board, so that the



assignment of Supervisors (internal and possibly external) can be carried out ensuring adequate guidance and support to PhD students [D.PHD.2.3].

## **Art. 4**

### **Design, planning and promotion of visibility - Approval of the annual calendar of training activities**

1. The Coordinator (or his/her delegate), the PhD Quality Assurance Group and the Academic Board, **within the month of December** of each calendar year, proceed in a Board Meeting to approve a calendar of training activities for the following calendar year. The calendar includes ad hoc institutional courses for doctorates, and master's degree courses, doctoral schools and advanced training courses, participation in conferences, study days, workshops, conferences and webinars of other scientific profile, periods of study and research in other Italian and foreign locations, laboratory activities in presence and remotely, publication in scientific journals, revision of articles in scientific journals, participation in national/international research calls and research projects, participation in teaching and tutoring activities consistent and compatible with the research activities carried out, in order to promote an articulated growth of PhD students [D.PHD.2.1].
2. In quantitative terms, the Ph.D. program provides for the acquisition of 180 credits over the three years, approximately 60 per year. Of these, 36 can be acquired through the attendance of ad hoc institutional courses for doctorates, and master's degree courses, if compatible. The other credits are acquired through other training activities. In the 3 years, the PhD student must acquire 36 credits of ad hoc courses (approximately 12 credits per year) and 144 credits of other educational activities (approximately 48 credits per year). [D.PHD.2.1] and [D.PHD.1.3].
3. The design of the training activities is developed in line with the training objectives of the Course and with the available resources [D.PHD.1.2], as well as with the outgoing cultural and professional profiles [D.PHD.1.3].
4. In the planning of the training activities, the balance is sought between fundamental themes for the growth of PhD students as independent researchers, in particular in research methodology, specialized topics and topics more oriented to multidisciplinary, transdisciplinary and interdisciplinarity. Particular attention is paid to training on: research ethics, dissemination and communication of research results, knowledge of European and international research systems, aspects of advanced linguistic study [D.PHD.1.3]. Furthermore, the training activities cover both topics related to the training project and issues relevant to the debate on science and the impact on society of scientific research in the macro-sectors of reference [D.PHD.2.1].

## **Art. 5**

### **Design, planning and promotion of visibility - Approval of the annual calendar of meetings between PhD students**

1. The Coordinator (or his/her delegate), the PhD Quality Assurance Group and the Academic Board, **within the month of December** of each calendar year, proceed to approve a calendar of meetings between the PhD students for the following calendar year.
2. The meetings between PhD students, aimed at the presentation of research results, exchange and comparison, have the aim of promoting the growth of PhD students as members of the scientific community, starting from the internal experience of the minimum nucleus of community constituted by the members of the Course [D.PHD.2.2].

## **Art. 6**

### **Design, planning and promotion of visibility - Updating of the PhD web**



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## pages

1. The Coordinator (or his/her delegate), the PhD Quality Assurance Group and the Academic Board pursue the transparency and visibility of the PhD Programme, both nationally and internationally [D.PHD.1.2; D.PHD.1.3; D.PHD.1.5; D.PHD.2.1; D.PHD.2.2; D.PHD.2.7].
2. **Within the month of January** of each year, the Coordinator (or his/her delegate) and the quality assurance group of the PhD programme are responsible for preparing at the relevant Offices the updating on the web pages of the PhD Programme of the data relating to the activities of the PhD students [D.PHD.2.7] such as:
  - a) Scientific products;
  - b) Stays for research activities abroad;
  - c) Periods of research activity at public or private institutions other than the Course Location.
3. **Within the month of January** of each year, the Coordinator (or his/her delegate) and the quality assurance group of the PhD programme are responsible for preparing the updating on the web page of the PhD Programme of the data relating to the activities of the Professors [D.PHD.1.5] such as:
  - a) *Curriculum vitae*;
  - b) Research topics;
  - c) Scientific products.
4. **Within the month of July** of each year, the Coordinator (or his/her delegate) and the quality assurance group of the PhD programme are responsible for arranging at the relevant Offices the updating on the web page of the information relating to the training and research project, the organization of the Course and the services available to PhD students, as well as on the call for admission to the Course [D.PHD.1.2; D.PHD.1.3; D.PHD.1.5; D.PHD.2.2; D.PHD.2.3].
5. **By December** of each year, the Coordinator (or his/her delegate) and the quality assurance group of the doctorate are responsible for arranging at the relevant offices the updating on the web page of the information on the calendar of training activities and meetings between PhD students scheduled for the following calendar year [D.PHD.1.3; D.PHD.2.1; D.PHD.2.2; D.PHD.2.7]. This information will be supplemented during the year by information on seminars and congresses promoted by the Doctoral Course.

## Art. 7

### **Data collection activities on the quality of the PhD Course - Data collection on the activities of PhD students and AVA3 Quality Indicators**

1. **Within the month of December** of each year, the Coordinator (or his/her delegate) and the PhD quality assurance group are responsible for preparing the collection and transmission to the PhD Offices of the data relating to the activities of the PhD students for the previous year of the Course [D.PHD.3.1] with reference to the following categories:
  - a) Scientific products [D.PHD.2.3; D.PHD.2.7];
  - b) Training activities (courses, seminars, workshops, conferences) outside the Course [D.PHD.2.2];
  - c) Stays for research activities abroad [D.PHD.1.6; D.PHD.2.6];
  - d) Periods of research activity at public or private institutions other than the Course Location [D.PHD.1.6; D.PHD.2.6].
2. **Furthermore, by December** of each year, the Coordinator (or his/her delegate) and the PhD Quality Assurance Group are responsible for preparing the collection and transmission to the PhD Offices of the following data with reference to the past calendar year:
  - a) Percentage of students enrolled in the first year of the PhD Programme who have obtained an admission qualification at another university [AVA3, Ind. 1];
  - b) Percentage of PhDs who spent at least three months abroad [AVA3, Ind.



2];

- c) Percentage of scholarships funded by external bodies [AVA3, Ind. 3];
- d) Percentage of PhDs who have spent at least six months of their training in public or private institutions other than the location of the course (including months spent abroad) [AVA3, Ind. 4];
- e) Number of research products generated by PhDs within one year from the end of the course [AVA3, Ind. 5].

## Art. 8

### Data collection activities on the quality of the PhD Course -

#### Survey of the opinion of PhD students and PhDs

1. **By November** of each year, the Doctoral Offices are responsible for submitting to the PhD students who are at the end of each of the three years of the Course and to the PhDs who have obtained the title for one year the questionnaire for the survey of relevant opinions [D.PHD.3.1; D.PHD. 3.3; AVA3, Ind. 6].
2. **By December** of each year, the Doctoral Offices are responsible for transmitting the results of the questionnaires to survey the opinions of PhD students to the Coordinator, his delegate and the PhD quality assurance group.

## Art. 9

### Data collection activities on the quality of the PhD Course -

#### Consultation of interested parties

1. In order to pursue the continuous updating of the training and research project of the Course with reference to the cultural and scientific evolution of the disciplinary areas of reference, the coordinator, his delegate and the quality assurance group of the doctorate and the Board of Professors proceed annually to carry out direct and indirect consultations of the parties interested in the outgoing cultural and professional profiles [D.PHD.1.1; D.PHD.3.3].
2. Consultations are carried out between **September and December** of each year.
3. Indirect consultations take place through the analysis of sector studies, carried out by the Coordinator, his/her delegate and the Ph.D. quality assurance group and by the Academic Board with reference to the outgoing cultural and social profiles.
4. Direct consultations take place through the annual consultation of an Advisory Committee established by the Coordinator, his/her delegate and the PhD Quality Assurance Group and the Doctoral Board.  
The Advisory Committee is composed of internal and external members of the Doctoral Board. As a rule, the Coordinator and at least one representative of the Academic Board for each scientific field represented in the active PhD cycles are internal members of the Advisory Committee. External members of the Advisory Committee are experts representing the scientific, productive and social fabric of reference, to the extent of at least one Member for each scientific field represented in the active PhD cycles. In addition, at least one representative of the Alumni of the Doctoral Course (possibly gathered in an association) is invited to participate.  
The annual meeting of the Advisory Committee is convened by the Coordinator. During the meeting, the opinions of the interested parties are collected and discussed on the training and research project, the outgoing cultural and professional figures, the prospects for development and future evolution with reference to the reality of the world of professions and services, and the needs and requirements expressed by it.  
The results of the consultation are reported in a summary report that records in particular those present at the meeting, specifying their role; the agenda of the meeting; the results of the consultation.  
Interactions within the Advisory Committee may be repeated throughout the year in accordance with the need for mutual exchange between the



representatives of the Course and the interested parties.

## **Art. 10**

### **Monitoring, analysis and proposal of improvement actions - Monitoring of PhD students' activities and AVA3 Quality Indicators**

1. **Within the month of January** of each year, the Coordinator or his/her delegate and the quality assurance group of the PhD and the Academic Board carry out during a Session the monitoring and analysis of the data collected with reference to the activities of the PhD students and the AVA3 Quality Indicators referred to in Art. 7 of these Regulations [D.PHD.3.1].
2. In particular, attention is paid to the pursuit of the objectives of mobility and internationalization [D.PHD.1.6] as well as to the strengthening of national and international scientific relations, achieved through the promotion for PhD students of mobility periods consistent with the research project and of appropriate duration at qualified academic and/or industrial institutions, and at public or private research institutions, Italian or foreign [D.PHD.2.6].
3. Particular attention is also paid to the fact that the creation of the conditions for the autonomy of the PhD student in terms of conception, design, implementation and dissemination of research and/or innovation programs has been pursued [D.PHD.2.3] and that the publication of scientific products directly attributable to PhD students has been promoted [D.PHD.2.7].
4. The level of participation of PhD students in teaching and tutoring activities is monitored, within the limits of compatibility with the research activity carried out [D.PHD.2.5].
5. On the basis of the analyses carried out, the Coordinator and the College can set medium and long-term objectives.

## **Art. 11**

### **Monitoring, analysis and proposal of improvement actions - Monitoring of the opinion of PhD students and PhDs**

1. **Within the month of January** of each year, the Coordinator or his/her delegate and the PhD quality assurance group and the Academic Board shall carry out during a Session the monitoring with analysis of the data collected from the questionnaires for the detection of the opinions of PhD students and PhDs referred to in Art. 8 of these Regulations [D.PHD.3.1].
2. In particular, attention is paid to the pursuit of the objectives of mobility and internationalization [D.PHD.1.6] as well as to the strengthening of national and international scientific relations, achieved through the promotion for PhD students of mobility periods consistent with the research project and of appropriate duration at qualified academic and/or industrial institutions, and at public or private research institutions, Italian or foreign [D.PHD.2.6].
3. Particular attention is also paid to the fact that the creation of the conditions for the autonomy of the PhD student in terms of conception, design, implementation and dissemination of research and/or innovation programs has been pursued [D.PHD.2.3] and that the publication of scientific products directly attributable to PhD students has been promoted [D.PHD.2.7].
4. It is monitored that adequate financial and structural resources have been made available to carry out research activities [D.PHD.2.4].
5. The level of participation of PhD students in teaching and tutoring activities is monitored, within the limits of compatibility with the research activity carried out [D.PHD.2.5].
6. On the basis of the analyses carried out, the Coordinator and the College can set medium and long-term objectives.

## **Art. 12**



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## **Monitoring, analysis and proposal of improvement actions - Monitoring of the results of the consultations**

1. **Within the month of January** of each year, the Coordinator and the Teaching Board shall carry out an analysis of the results of the consultations of the parties interested in the outgoing cultural and professional profiles referred to in Article 9 of these Regulations [D.PHD.3.3].
2. The Coordinator shall present to the Board of Trustees the results of direct and indirect consultations. The College proceeds to discuss what has emerged.
3. On the basis of the analyses carried out, the Coordinator and the College can set medium and long-term objectives.

### **Art. 13**

## **Monitoring, analysis and proposal of improvement actions - Budget monitoring of economic and structural resources requested, available and used**

1. **Within the month of January** of each year, the Coordinator or his/her delegate and the quality assurance group of the PhD and the Academic Board shall carry out during a Session the monitoring of the allocation and methods of use of the structural and economic resources made available to the PhD students during the previous calendar year as specified in the Internal Regulations relating to the procedure for the request of funds by the PhD students [D.PHD.3. 2]. Requests for funds from PhD students authorized by the Course Coordinator are received during the year in the Ordinary Sessions.
2. The balance between the structural and economic resources available, requested and used is monitored, also in terms of interaction with the University Bodies to bring out any requests for increases or changes in the resources provided.
4. It is monitored that adequate financial and structural resources have been made available to carry out research activities [D.PHD.2.4].
5. In particular, it is monitored that adequate financial resources have been made available for the pursuit of the objectives of mobility and internationalization [D.PHD.1.6] as well as for the strengthening of national and international scientific relations, achieved through the promotion for PhD students of mobility periods consistent with the research project and of adequate duration of mobility at qualified academic and/or industrial institutions, and at public or private research institutions, Italian or foreign [D.PHD.2.6].
6. It is monitored that adequate financial resources have been made available for the growth of PhD students as members of the scientific community, through the promotion of participation in national and international congresses and/or workshops and/or training schools [D.PHD.2.2].
7. It is monitored that adequate financial resources have been made available to create the conditions for the autonomy of the PhD student in terms of conception, design, implementation and dissemination of research and/or innovation programs [D.PHD.2.3] and to promote the publication of scientific products directly attributable to PhD students [D.PHD.2.7].
8. On the basis of the analyses carried out, the Coordinator and the College can set medium and long-term objectives.

### **Art. 14**

## **Monitoring, analysis and proposal of improvement actions - Analysis of monitoring results and drafting of the Summary Document**

1. **Within the month of January** of each year, the Coordinator or his/her delegate and the quality assurance group of the PhD and the Academic Board, following the analysis and discussion of the results of the monitoring referred to in Articles 10-13 of these Regulations, proceed during a Session to approve a Summary Document [D.PHD.3.3].



**2. The Summary document contains:**

- a) Analysis of the results of the monitoring of the activities of the PhD students;
- b) Analysis of the results of the monitoring of the AVA3 Quality Indicators;
- c) Analysis of the results of the monitoring of the opinion of PhD students and PhDs;
- d) Analysis of the results of the monitoring on what emerged from the consultations of the parties interested in the outgoing cultural and professional profiles;
- e) Analysis of the results of the monitoring of the budget between the economic and structural resources available, requested and used;
- f) Planned improvement actions to be implemented in the design of the Course.

**3. Within the month of January** of each year, following approval, the Coordinator inserts the Summary Document into the University Archiving System.

**4. Within the month of January** of each year, following approval, it sends the Summary Document to the Director of the Department of Human Sciences, to which the Doctorate belongs.

**Art. 15**

**Monitoring, analysis and proposal of improvement actions - Joint meeting of Coordinators, Representatives of the PhD students and the Presidium of the Quality of the University**

- 1. Within the month of February** of each year, the Coordinator or his/her delegate and the quality assurance group of the Course doctorate participates in a joint meeting organized by the University Quality Assurance Committee (PQA), which is attended by the Coordinators of the Doctorates active at the University and at least one Representative of the PhD students, in order to share the results of the monitoring and the planned improvement actions [D.PHD.3.3].
- 2.** The PQA shall draw up minutes of the meeting.

**Art. 16**

**Commencement**

- 1.** These Regulations shall enter into force at the same time as they are approved by the Academic Board and issued, and shall fully replace any previous versions.

Rome, 26 May 2023.