

## REGULATIONS OF THE PhD PROGRAMME IN COMPUTER SCIENCE AND MATHEMATICS – XXXIX CYCLE

Approved by the Academic Board on December 21<sup>st</sup> 2023

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### Art. 1 – Object of the Regulations

In conformance with the requirements of the Ministry of University and Research, this regulation defines the management and the operation of the PhD Programme in Computer Science and Mathematics.

### Art. 2 – Objectives

In addition to the general objectives illustrated in the Regulation concerning the PhD Programmes of the University of Bari Aldo Moro (hereafter referred to as “University Regulation”), issued in the University Decree no. 1867, on May 17<sup>th</sup> 2022, the specific goal of the PhD Programme in Computer Science and Mathematics is to create highly professional and autonomous researchers able to take direct responsibilities in research activities, specifically in macro-areas, such as 01-A Mathematics, 01-B Computer Science and 09-H Computing Engineering.

A further goal of the PhD Programme is to integrate PhD Students as *early stage researchers* into exchanges and internship systems possibly developing national and international relationships. This will also be achieved through the participation of the PhD Students in research projects of the Departments involved in the PhD Programme.

At the end of the PhD Programme the Students should be well versed in the state of the art related to their PhD thesis. They should also be able to communicate with researchers on related topics, participate in international projects and identify and validate the eventual practical and technological impact of their research. Thanks to some teaching experience (see art. 15), the Students should be ready to collaborate in any academic course where specific disciplinary skills

are required.

### **Art. 3 – Areas and scientific disciplines**

The reference areas of the PhD Programme are

- Area 01 (Mathematics and Computer Science)
- Area 09 (Computing Engineering)

The scientific disciplines connected to the PhD Programme are:

- INF/01 Computer Science,
- ING-INF/05 Information Processing Systems,
- MAT/02 Algebra,
- MAT/03 Geometry,
- MAT/04 Mathematics Education and History of Mathematics,
- MAT/05 Mathematical Analysis,
- MAT/06 Probability and Statistics,
- MAT/07 Mathematical Physics,
- MAT/08 Numerical Analysis.

### **Art. 4 – General characteristics**

The PhD Programme lasts 3 years. Candidates are admitted after a public selection. Calls for applications are published every year on the University of Bari website, indicating the number of positions and scholarships available.

The most qualified Students are admitted to the PhD Programme, regardless of age, nationality, religion, gender orientation, race and social class.

The official languages of the PhD Programme are Italian and English, therefore foreign Students are encouraged to learn Italian.

Admission tests are usually performed in Italian or English. The candidate should also demonstrate an appropriate knowledge of English. The PhD dissertation can be written in Italian, in English or in another language, if approved by the PhD Academic Board (see Art. 5).

### **Art. 5 – PhD Academic Board and PhD Coordinator**

The PhD Programme Bodies are:

- a) The PhD Academic Board
- b) The PhD Coordinator

The PhD Academic Board (hereafter Academic Board) is formed according to the Art. 4 of the University Regulations and works according to both the University Regulations and the Regulations of the PhD Programme in Computer Science and Mathematics – XXXIX Cycle.

The Academic Board meets at least twice a year either upon request of the PhD Coordinator (hereafter Coordinator) who chairs it, or upon request of the majority of its members. Notices



regarding an upcoming meeting are sent out at least seven days before the meeting date, usually by email. If the meeting is urgent, the notice could be sent three days before the meeting date. The agenda is usually communicated together with the meeting date.

The Academic Board meeting is considered to be duly constituted if the majority of its members is present: the majority is determined after excluding those members who provided a written communication of the impossibility to participate in the meeting; however, at least 2/5 of the members have to be present for the meeting to be activated. Decisions discussed during the meeting are valid if approved by the majority of the members present at the meeting. In case the number of votes in favor is equal to the sum of the votes against and of the abstentions, the Coordinator's vote will prevail.

At the Academic Board meetings, the PhD Student representatives (see Art. 6) may participate in discussions on topics concerning the general evolution of the program or learning activities, but they are not allowed to vote.

The Coordinator is elected by the Academic Board, as established by the Art. 4. of the University Regulations. The Rector of the University will approve the nomination with an administrative act. The Coordinator stays in charge for three years and can be re-elected only once, but not exceeding a total amount of six years.

The Coordinator supervises and performs tasks defined in the University Regulations and in the current Regulations.

#### **Art. 6 – Election of the PhD Student representatives**

The maximal number of PhD Student representatives in the meetings of the Academic Board is at most 1/6 of the total number of PhD Students enrolled in the XXXIX cycle. The Academic Board nominates three of its members to constitute an Election Committee that is in charge of organizing the election procedures. The Election Committee interacts with all the PhD Students to handle candidacy submissions and voting. The PhD Student representatives are elected in the middle of the first year and they stay in charge for two years. If a candidate leaves before the end of the two years, the role is passed to the Student with the highest number of votes among those non-elected in the first election. If two or more candidates obtain an equal number of votes, the oldest Student is elected.

#### **Art. 7 – Supervisor and co-Supervisor**

Within three months since the beginning of the PhD Programme, the Academic Board assigns a Supervisor to each PhD Student.

The Supervisor is chosen out of the members of the Academic Board available for this role, taking into account the Student's PhD curriculum and research field.

The duties of the Supervisors include helping Students to improve their study and research techniques, integrating them into a research activity, and suggesting a research topic. Moreover, Supervisors must guide Students to develop a plan for their academic path, follow the Students' research path and prepare them for the final thesis. The Supervisors must also guide Students to choose courses included in the PhD Programme or, if required, in other educational and research institutions (see Art. 9). Any Supervisor has to inform the Academic Board about the research activities and eventual problems of any PhD Students under his/her responsibility. The Supervisors should also inform the Academic Board if part of the Student's PhD research activity

should be completed abroad.

The Academic Board can also nominate one or more co-Supervisors for a Student, internal or external to the Academic Board; the co-Supervisor collaborates with the Supervisor in his/her duties and contributes further to the Student's scientific and technological knowledge.

If necessary, the Academic Board may revoke a Supervisor, only after finding a substitute, whereas it may revoke a co-Supervisor without necessarily nominating a substitute.

#### **Art. 8 – Evaluation Committee**

After a PhD Student has presented his/her research project and study plan, the Academic Board nominates the Student's Evaluation Committee composed of the Student's Supervisor (and Co-Supervisor(s) if any) and two other professors/researchers, of whom at least one must be a member of the Academic Board.

In general, at least one of the two members of the Evaluation Committee should belong to the same scientific research field or hold the National Scientific Qualification in the same scientific disciplinary field as the Supervisor but should not have continuous collaborations with the PhD Student.

The aim of the Evaluation Committee is to follow the Student activity and progress through periodical meetings during the academic year and to evaluate the Student's research work. In particular, the Evaluation Committee evaluates:

- The progress of the Student's research project and his/her study plan (see Art. 9).
- The end-of-the-year reports produced by the Student (see Art. 11 and Art. 12), providing a written report to the Academic Board.
- The preliminary version of the thesis (see Art. 12).

#### **Art. 9 – Training Activities**

The PhD programme offers the following courses:

- a) Specialized courses, of 1, 2 or 3 credits, for a total of 15 credits (each credit corresponds to either 8 hours of lectures plus 17 hours of individual works or 15 hours of practice plus 10 hours of individual works), which are topic specific. Any Student chooses, jointly with his/her Supervisor, the courses to be attended during the first two years depending on his/her interest. Four such courses, for a total amount of at least 8 credits, require a final exam to be given by the end of the second year of the PhD Programme. This type of course may also include international summer/winter schools of interest for individual research and courses in other PhD programmes. Courses of Master's degrees are not included in the credit computation. Online courses are considered as specialized courses only if the final exam is passed. Students are recommended to attend courses activated by the University of Bari for acquiring soft skills, but, if they are not specifically devoted to PhD Students, they are evaluated as additional educational activities and are not considered as specialized courses. Any Student must ask for credit recognition of courses not included in any of the PhD Programmes of the University of Bari or of other universities in agreement with the PhD Programme; a maximum of three credits for each external course can be recognized. In order to achieve credit recognition of a course, any PhD Student must attend at least 70% of the scheduled hours.
- b) Seminar cycle on “Scientific Research Writing” (10 hours).
- c) Seminar cycle on “Information Technology Outlook” (10 hours).

- d) Seminar cycle on “Research Management, Research Systems and Funding Systems” (10 hours).
- e) Seminar cycle on “Dissemination of research results and intellectual property” (10 hours).

The seminar cycles (b-e) are activated during the whole period of the PhD Programme. During the three years any PhD Student must attend, for each seminar cycle, at least 10 hours, in presence or remotely but with a final exam if applicable.

Any change or exception to these program requirements, regarding either attendance or exams, must be supported by a request written by the PhD Student and approved by the Academic Board.

The PhD training activities may be done either in Italian or English.

The list of courses and their schedules are discussed and approved every year by the Academic Board; the schedules may be modified by the Coordinator when necessary. The Coordinator communicates any variations via the PhD Programme website.

#### **Art. 10 – Study and research activities abroad**

The PhD Student should consider spending some time abroad in foreign institutes to deepen his/her research. The period abroad should last at least three months in total, but it can be taken in shorter periods, each lasting no less than one month. Students may choose to study in just one foreign institute, but they can also decide to study in different countries, if it is strictly beneficial to their research.

PhD Students may study abroad or in other universities in Italy for up to six months, if authorized by the Coordinator. Any request to extend this period beyond the allowed six months must be approved by the Academic Board. In any case, the period abroad cannot last more than half of the whole PhD Programme duration.

Exceptions concerning the period abroad and its duration must be discussed and approved by the Academic Board.

#### **Art. 11 – Admission to second and third year**

Each PhD Student:

- a) must demonstrate a very good attendance record in the PhD Programme, as established by the Academic Board. The attendance requirement is 1500 hours per year, and it is reported on the activity board.
- b) at the end of the first year, must have passed at least two courses (grade of at least 18/30) of the PhD Programme; at the end of the second year, must have passed at least four courses (grade of at least 18/30) for a total of at least 8 credits (including first-year courses) and attended specialized courses for at least 15 CFU.
- c) must obtain a positive evaluation by the Academic Board at the end of the year. This includes an evaluation of the Student’s written annual report and the results of the interview by the Evaluation Committee related to the activities of the PhD Student. The evaluation will also consider publications in:
  - International Conference Proceedings with peer review.
  - ISI and/or SCOPUS Indexed Journals.

The PhD Student who does not fulfill the above requirements can be admitted conditionally to the next year, but the condition must be met within three months.



### **Art. 12 – Admission to the final exam**

To be admitted to the final exam, the PhD Student should present the preliminary version of his/her thesis within two months of the end of the final year. The structure of the thesis must have been previously discussed by the PhD Student with his/her Supervisor and co-Supervisor(s), if any.

Once the Evaluation Committee has expressed its opinion on the preliminary version of the thesis, the Academic Board will evaluate each PhD Student on his/her activities carried out during the PhD Programme, as well as on his/her publications, to admit the Student to the final exam. The admitted Students will then be evaluated by two or more highly qualified researchers (referees), affiliated to other universities or institutions, possibly from abroad. At least one of the referees should be a Professor. These referees are selected by the Academic Board.

Once the PhD Student is informed by the Coordinator of the names of the referees, he/she will have to send the thesis jointly with a report on the activities of the three years and the list of his/her publications. The referees are required to evaluate the PhD Student's thesis within 30 days and will give the Coordinator a detailed report including their comments and suggestions on how to improve it. They can either admit the PhD Student's thesis or require a major revision within six months. After this time, the thesis is admitted anyway to the defense and the referees are requested to provide a new evaluation report. Upon request of both the Student and the Supervisor, the Academic Board may grant an extension of the maximum duration of twelve months for motivated scientific reasons, according to Art. 4 comma 12-b of the University of Bari regulation. Any request to fund the additional year has to be evaluated according to Art. 8 comma 25.

### **Art. 13 – Final exam for obtaining the PhD degree**

A Committee of experts, nominated by the Academic Board, is appointed by the Rector of the University with an administrative act and should respect, if possible, gender balance. It is composed of three members, plus three substitute members. At least two experts are selected from full professors, associate professors and researchers of the scientific sectors of the PhD Programme, who may also come from foreign universities. In addition, there can be as further members no more than two experts belonging to public and/or private research institutions, including foreign institutions.

The members of the Academic Board and the Co-Supervisors cannot be members of the Committee of experts.

At least two members of the Committee of experts must be external to the University of Bari.

Members of the Committee of experts of the previous year of this PhD program cannot be members of the Committee.

The administrative act of the Rector of the University establishes the nature and duration of the Committee's duties. Starting from the date of the administrative act, the Committee has 60 days to conclude its work. After this deadline, the Committee is not effective anymore and, if its duties are not finalized, the Rector will nominate a new Committee.

The administrative act also determines how to inform the PhD candidate about the Committee and the final exam date. The PhD candidates must send a copy of their thesis to the Committee at least 29 days before the final exam date. The final exam consists of a public presentation to defend the thesis. At the end of the discussion, the Committee approves or rejects the thesis providing a written evaluation. The Committee may confer a grade “summa cum laude” by unanimous

decision, in recognition of important scientific results achieved by the PhD candidate.

If, for any reason, some of the Committee members cannot be present at the final exam, the examination may be done by videoconference. This is allowed only provided that at least two members of the Committee are physically present during the exam.

The research and training activities performed by the PhD Students are certified in a diploma supplement.

#### **Art. 14 – PhD Student Duties**

Each PhD Student must:

- plan his/her research work with the Supervisor, and possibly co-Supervisor(s), defining multiple meeting times (at least once a month)
- submit the research project and the plan for study and scientific activities, agreed with the Supervisor and the possible co-Supervisor(s), within the first three months
- respect deadlines when developing the research project and the study plan, presenting written reports as required
- inform the Evaluation Committee about the research progress, defining at least two meeting each year
- discuss any possible problem with the Supervisor and/or co-Supervisor(s) or, under extreme circumstances, with the Coordinator.

#### **Art. 15 – Tutoring and teaching activities by PhD Students**

As established by Art. 8 of the University Regulations, PhD Students can provide tutorial assistance to Students or support teaching activities for courses offered by the Department of Computer Science and the Department of Mathematics. The Academic Board must discuss and approve these tutoring and teaching activities, which cannot exceed 40 hours of work in each of the first two years of the PhD Programme.

#### **Art. 16 – Amending the Regulations**

Each proposal to amend these Regulations must be approved by the Academic Board. Any amendments come into effect the day after the Academic Board's decision.

#### **Art. 17 – Final Rules and related Regulations**

These Regulations complement the current National and University Regulations concerning the PhD Programmes.