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PhD School - Politecnico di Milano

Regulations of the PhD Programme in:

Mathematical Models and Methods in Engineering

Cycle XXXIX

1. General Information

PhD School - Politecnico di Milano

PhD Programme: Mathematical Models and Methods in Engineering

Course start: 12/09/2023

Location of the PhD Programme: Milano Leonardo

Promoter Department: Dipartimento di Matematica

Scientific Disciplinary Sectors

MAT/02 Algebra; MAT/03 Geometry; MAT/05 Mathematical Analysis; MAT/06 Probability and Statistics; MAT/07 Mathematical Physics; MAT/08 Numerical Analysis; SECS-S/01 Statistics; SECS-S/06 Mathematical Methods of Economy, Finance and Actuarial Sciences.

PhD School Website: http://www.polimi.it/phd
PhD Programme Website: https://www.mate.polimi.it/dottorato/

2. General presentation

Mathematical modeling plays a central role in the development of engineering, life sciences, physics and finance. The Department of Mathematics of Politecnico di Milano as well as its laboratories (MOX Laboratory of Modeling and Scientific Computing, Quantitative Finance Lab, etc.) have earned a strong reputation worldwide for the high quality of the research. The Department of Mathematics of Politecnico di Milano has been awarded the grant “Department of Excellence” by MUR (Italian Ministry of University) for the years 2023-2027. After a pre-selection based of an evaluation of the research performed at DMAT in the last years, a project of future development of DMAT has been evaluated and awarded by a committee chosen by MUR. Such a prestigious award comes in addition to the result obtained within the QS World University Rankings for Mathematics 2023, which placed the Department of Mathematics of Politecnico di Milano, for the second time, as the first one among the Italian departments in the same academic subject. Furthermore, the Department of Mathematics has developed close interactions with several engineering, mathematics and physics departments of Politecnico and of many other Italian and international institutions, industrial firms and research agencies.

Since the start (in 2008, 24th cycle), the PhD program in “Mathematical Models and Methods in Engineering” has focused its activities on the development of advanced mathematical theories and of methods for solving practical and theoretical problems of scientific, industrial or technological interest. Correspondingly, five thematic macro-areas have been identified for the PhD research:

- mathematical models and methods in physics;
- mathematical models and methods in materials science;
- mathematical models and methods in life sciences;
- mathematical models and methods in earth and environmental sciences;
- mathematical models and methods for industrial and financial processes.

Each thematic area gathers, in an interdisciplinary manner, the know-how needed to develop models, involving different scales and different physical theories, essential to study problems whose complexity arises either from the entangled geometry and topology (see, e.g., the analysis of blood flow in the cardiovascular human system), from the interaction between micro- and macroscopic degrees of freedom (as in the coupling between quantum systems and a classical environment or apparatus), from the emergence of macroscopic phenomena from microscopic first principles (as in the observation of quantum features at the macroscopic scale in Bose-Einstein condensates or superconductors), from the wide range of timescales involved (as in the sedimentary evolution in geological basins), from the computational complexity of the solution algorithms (as in the optimization of NP-hard problems in industrial applications), from the complexity of the statistical methods to analyse big and high dimensional data or from the lack of deterministic solutions (as for the stochastic evolution in quantitative finance or the statistical processing of huge number of functional data).

A special attention will be devoted to the three main research line of the scientific project of the "Department of Excellence" MUR grant:

- *Fluid-structure interaction*. The goal is to address key questions concerning the behavior of fluids in interaction with complex structures, like the stability of both the fluid and the structure or optimal position and shape optimization of the structure within the fluid, by theoretical and computer-assisted methods.
- *Mathematics for sustainable development*. The main goals for this topic are the development of mathematical models and numerical methods with applications to biomedicine (e.g., precision medicine, mathematical oncology, neurosciences) and for the sustainable use of the subsoil and mitigation of the effects of human activities (e.g., CO2 sequestration, geothermal reservoirs), as well as the implementation and analysis of scientific machine learning algorithms.
- *Mathematical features of quantum mechanics*. The modelisation of several quantum phenomena, as decoherence, entanglement or dissipation, as well as the emergence of effective (nonlinear) models in suitable regimes and the relation between the quantum and classical worlds, as in the measurement process, are addressed by a combination of analytic, geometric and probabilistic methods.

The PhD course in "*Mathematical Models and Methods in Engineering"* has greatly benefited from the interactions with other university departments and external industries and research agencies. An evidence of such a fruitful interaction is pointed out by several thematic PhD grants funded by external sponsors. Several grants have also favored student mobility (more than half of our candidates possess a MSc degree different from the Mathematical Engineering degree directly supplied by the Department of Mathematics of Politecnico di Milano). The inter-disciplinary character of the PhD program is confirmed also in the Faculty Board, where several disciplines are represented.

The main research subjects sponsored by external institutions in the last four years:

- “Enhancing Diagnostic Tools and Decisional Skills for Regional Air Quality Monitoring and Management”, funded by PNRR Italia Domani (Next Generation EU);
- “Physics-Informed Statistical Learning for High-Dimensional and Complex Neuroimaging Data”, funded by PNRR Italia Domani (Next Generation EU);
- “BioPros: bio-intelligent production sensor to measure viral activity”, Horizon Europe Framework Programme HORIZON-CL4-2021-DIGITAL-EMERGING-01-27, funded by EU;
- “Advanced polyhedral discretisations of heterogeneous PDEs for multiphysics problems”, PRIN 2020, funded by MUR;
- “Mathematics for industry 4.0 (Math4I4)”, PRIN 2020, funded by MUR;
- “An integrated Heart Model for the simulation of the cardiac function (iHEART)”, ERC Advanced Grant, funded by EU;
- VINCI fellowship “A new computational approach for fluid-structure interaction of slender bodies immersed in three-dimensional flows “, in collaboration with Sorbonne Université, Paris.

The main projects involving collaboration with external partners fully or partially supporting the research include:

- “Physics-informed data augmentation for machine learning applications” (Intellico);
- “Numerical simulation of free-surface flows in industrial mixing processes” (Pirelli Tyre Spa);
- “Multiscale modeling of partial discharges and treeing” (RSE);
- “Development of models and algorithms in the field of functional data analysis for satellite monitoring of natural hazards” (CNR – IREA);
- “Numerical and statistical modelling of geological and geophysical processes” (ENI Spa);
- “Discontinuous spectral elements for the modelling of seismic events” (Munich Re);
- “High performance simulation of power semiconductor devices” (ABB);
- “Mathematical modeling of nanoscale therapeutic systems” (Regione Lombardia, CEN Foundation, Politecnico di Milano, Fondazione Politecnico di Milano);
- “Memristive devices for brain inspired computing” (CNR);
- “Numerical modeling of continuous mixing processes in industrial applications” (Fondazione Politecnico di Milano, Pirelli Tyre Spa);
- HERO fellowship “Hierarchical computational models for predicting the vascular and Extravascular transport of molecules, nanoconstructs and cells in neoplastic tissues” (IIT-Genova);
- “Development of mathematical and statistical tools for the analysis of data generated by smart grid” (ABB);
- “Numerical and statistical modelling of geological and geophysical processes” (ENI);
- “Multi-GPUs based Particle in Cell- Material Point Methods for Compressible Flows” (Leonardo Spa).

The PhD course is run by a Coordinator and a Faculty Board. The Coordinator chairs the Faculty Board, coordinates the preparation of the annual educational programme and organises the general educational activities of the PhD course (see Attachment A1). The Faculty Board is responsible for the educational programme and for teaching and administrative activities related to the PhD course (see Attachment A2).

3. Objectives

The development of advanced technologies in science and engineering (such as but not reduced to artificial intelligence, coding theory, data science, machine learning, mathematics for genomics and medicine, quantum information and computing) brings an increasing demand of advanced mathematical theories and methods, which in turn fosters the demand for education and training of skilled mathematicians in pure and applied research. The main scope of the PhD course "*Mathematical Models and Methods in Engineering"* is to train high-level researchers in various fields of pure and applied mathematics, statistics and mathematical finance. Several components must be mixed to guarantee a profitable success in applications. A deep knowledge of the relevant physical, chemical and/or biological phenomena is necessary, along with the ability in modeling complex systems, and the skills in the use and development of the mathematical tools able to provide quantitative solutions. With this aim, inter-disciplinary preparation and team-working capability are basic elements in the training of the PhD candidates.

4. Professional opportunities and job market

Candidates who successfully complete the PhD course possess a solid educational training in pure and applied mathematics, as they are required to achieve original research results in one or more of the following areas: numerical analysis, mathematical physics, mathematical analysis, statistical learning, stochastic modeling, geometry and algebra.
Candidates are also required to acquire competences and ability of performing critical analysis and design in one or more branches of science and engineering, including: fluid dynamics, quantum physics, bioengineering, material science, life sciences, decision making, geophysics, building science, energy, and risk assessment.
Expected professional placements for PhD doctorates: academic research in Italian or international universities and research institutions, R&D divisions of private companies, study and research centers of public agencies, financial and insurance institutions.

5. Enrolment

5.1 Admission requirements

Italian and international citizens can apply. They are requested to have graduated in accordance with the pre-existing laws D.M. 3.11.1999 n. 509, or to have a Master of Science degree in accordance with D.M. 3.11.1999 n. 509, or a Master of Science in accordance with D.M. 22.10.2004 n. 270, or similar academic title obtained abroad, equivalent for duration and content to the Italian title, with an overall duration of university studies of at least five years.
The certified knowledge of the English language is a requirement for admission. Please refer to the PhD School website for details.

The admission to the programme will be established according to the evaluation of the candidates' curricula, motivation letters, and an illustrative report about the development of a possible PhD research, which candidates will send contextually with their application to the admission announcement.

5.2 Admission deadlines and number of vacancies

The number of positions is indicated in the calls for admission to the 39th PhD cycle programmes. Scholarships both on general and on specific themes are available, in accordance with what is specified in the calls for admission.

6. Contents

6.1 Requirements for the PhD title achievement

The achievement of the PhD title in "*Mathematical Models and Methods in Engineering"* requires a study and research activity of at least three years equivalent of full-time study, research and development of PhD thesis.

PhD candidates in "*Mathematical Models and Methods in Engineering"* must earn a minimum of 30 course credits (see paragraph 6.3 below), and to continuously conduct studies and research.

At the beginning of the course, the Faculty Board assigns a tutor to each PhD candidate to supervise and assist him/her in the overall training programme. The tutor shall be a professor belonging to the Faculty Board. The tutors assist the candidates in the choice of courses to be included in the study plan, which is eventually submitted for approval to the Coordinator of the PhD programme (see also section 6.4 below).

The Faculty Board may assign extra course credits to one or more candidates, in case they need to complete their preparation in specific topics, relevant for their research projects.

Candidates will be asked to demonstrate knowledge of the Italian language, equal to at least A1 level of the Common European Framework of Reference for the knowledge of languages. This requirement will be needed in order to register for the final exam. Italian native speakers and all those who can demonstrate knowledge of the Italian language to the required level will be exempt.

6.2 Research development

The main aim of all Politecnico di Milano PhD programmes is the development in the candidates of a research-oriented mind-set, with expertise and skills in a specific research topic. To this end, candidates develop a problem-solving capability in complex contexts, including the capacity of performing deep analysis of the problems, identifying original solutions, possibly implementing them in scientific software and evaluating their applicability in practical contexts. These skills provide the PhD candidates with major opportunities of development in their research both in the academic field, and in public and private organisations.

PhD candidates are requested to develop an original research work. The PhD thesis must thus contribute to increase the knowledge in the candidate's research field. Besides, it has to be coherent with the research topics developed in the Department where the PhD Programme in "*Mathematical Models and Methods in Engineering*" is carried out.

The original research results are collected in the PhD thesis, where the candidate's contribution is put in perspective with respect to the research state of the art in the specific research field. The PhD

research is developed under the guidance of a supervisor, who supports the candidate in the setting-out and in the everyday activities related to the thesis development. The supervisor is not necessarily a member of the Faculty Board and may also belong to an institution different from Politecnico di Milano. The supervisor can be supported by one or more co-supervisors.
Further activities intended to develop the candidate's personal skills and research expertise are encouraged during the PhD path. Candidates must acquire the capability to present and discuss their work in their research community. Consequently, both the participation to international conferences and the publication of the research results in peer-reviewed journals are encouraged.
The PhD programme favors the candidates' research interactions with other groups in their research field, preferably abroad. Research visits of at least three months are strongly encouraged, as through them the candidates may acquire further skills to develop their research work and thesis.
The duration of the programme is normally three years.

6.3 Objectives and general framework of the teaching activities

The PhD programmes and the PhD School activate teaching forms of different kind and credit value, including courses, seminars, project workshops, laboratories. Teaching activities both cover the basic research issues (problems, theories, methods), which represent the founding element of the PhD programme and identify clearly its cultural position and deepening in a specialist way some research issues connected with the problems developed in the theses. Lessons are usually held in English, except when indicated otherwise. The PhD programme includes at least one complete path delivered in English language.
Structured teaching activities allow to earn ECTS credits. Other activities, typically specialised and for which it is difficult to evaluate the learning and its quantification, fall within the scientific activities of which the Faculty Board takes into account in the overall evaluation, but they do not allow to earn ECTS.

The PhD School of Politecnico di Milano proposes a set of courses aiming to train the PhD candidates in soft and transferable skills. The skills and abilities provided by these courses are expected to help candidates across different areas of their careers in order to respond to the rapidly evolving needs of the global economy and society at large. The list of PhD courses organized by the PhD School is available at the website http://www.dottorato.polimi.it/en/during-your-phd/phd-level-courses/.
At least 10 of the 30 course credits that each candidate is required to earn shall be obtained through soft and transferable skills courses organized by the PhD School.
The tables below summarize the candidate's path (as regards coursework activities). At the same time, the programme foresees that the candidates are devoted to research activity in a continuous way, following the lead of their supervisors, and of the Faculty Board.

First/Second Year

Courses	**Possible details or reference to following tables**	**Number of credits (or min-max)**	**Note**
PhD School courses		10	
courses		10-20	

characterising the PhD Programme			
other PhD courses	schools, workshops, reading courses	0-10	

Third year
In the third year the candidate should be devoted entirely to the research and to the development of the PhD thesis.

PHD COURSE LIST

- **A)** The PhD Programme in *"Mathematical Models and Methods in Engineering*" organises the **characterising courses** listed in table A, which are divided into **courses for a broad audience (BA)** and more **specialistic courses (SC)**. For the admission to the final exam the acquisition of at least 10 credits in this list is **mandatory**. The PhD candidates are **strongly encouraged** to attend at least 1 course outside their thematic area of research.
- **B)** The PhD School organises every year general and interdoctoral courses. The acquisition of **at least 5 credits** is **strongly suggested** among the courses of B type. The list of PhD courses organized by the PhD School is available at the website: http://www.dottorato.polimi.it/en/during-your-phd/phd-level-courses/
- **C)** A **maximum of 5 credits** can be obtained by choosing among courses provided by other PhD programmes at Politecnico di Milano and/or external Institutions (in this case the previous approval of the tutor and the coordinator is mandatory).

PREPARATORY COURSES
If the supervisor and the tutor find it useful or necessary that the candidate attends preparatory courses (chosen among the activated courses at Politecnico di Milano) the Faculty Board of the PhD programme may assign some extra-credits to be acquired to complete the training path. The credits acquired in this way will be considered as additional, in relation to the mandatory credits to be acquired with the PhD courses.

OTHER COURSES
The attendance of workshops, schools, seminars cycles is strongly encouraged and (if these seminars, workshops are certified and evaluated) may permit to acquire credits according the modalities established by the Faculty Board and previous approval of the study plan submitted by the candidate. These courses and workshops can be inserted in the study plan, even if they are not evaluated (and therefore not qualified as credits), as optional "additional teaching".

The scheduled course planning for the academic year 2023-2024 follows. Other courses may be activated during the year. In this case the candidates will be promptly informed and will be allowed to insert these new courses in their study plan.

Table A: PHD COURSES CHARACTERISING THE PHD PROGRAMME

SSD	Name of the course	Professor	Semester	Language	Credits
MAT/05 (BA)	*Stability and instability in dynamical systems*	Giuliani	Fall	English	5
SECS-S/01 (BA)	*Advanced statistical learning for complex data*	Ieva	Fall	English	5
MAT/08 (BA)	*Mathematical and numerical foundations of scientific machine learning*	Pagani, Miglio	Fall	English	5
MAT/05, MAT/07 (SC)	*Spectral and scattering theory in quantum mechanics*	Borrelli, Fermi	Spring	English	5
MAT/08 (SC)	*Advanced numerical methods for predictive digital twins*	Fresca, Zunino	Spring	English	5
MAT/05 (SC)	*Mathematical Aspects of Fluid Mechanics*	Giorgini	Fall	English	5
MAT/06 (SC)	*An introduction to the Malliavin calculus*	Zanella	Fall	English/Italiano	5
	Advanced mathematical methods in engineering I	Correggi	Spring/Fall		5
	Advanced mathematical methods in engineering II	Correggi	Spring/Fall		5

Table B SUGGESTED CROSS –SECTORAL COURSES

SSD	Name of the Course	Professor	Semester	Language	Credits
	Innovative Teaching Skills	Brunetto		English	5
	La Comunicazione nella Scienza	Paganoni		Italiano	5
	Practicing Research Collaboration	Rawad El Skaf		English	5
	English for Academic Communication	Biscari		English	5

	Industrial Skills	Biscari		English	5
	Scientific Communication in English	Biscari		English	5

6.4 Presentation of the study plan

PhD candidates must submit a study plan, which may be revised periodically (approximately every six months), in order to adequate them to possible changes in the course list, or to needs motivated by the development of their PhD career. The study plans must be approved by the PhD programme Coordinator, according to the modalities established by the Faculty Board of the PhD programme itself.

6.5 Yearly evaluations

Candidates present their work to the Faculty Board at least once a year. In particular, the candidates must pass an annual evaluation in order to be admitted to the following PhD year. The third year evaluation establishes the candidate's admission to the final PhD defense.

As a result of each annual evaluation, the candidates who pass the exam receive an evaluation (A/B/C/D) and may proceed with the enrolment at the following year. Candidates who do not pass the exam are qualified either as “Repeating candidate (Er)” or “not able to carry on with the PhD (Ei)”. In the former case (Er), the candidates are allowed to repeat the PhD year at most once. The PhD scholarships – if any – are suspended during the repetition year. In the latter case (Ei) the candidates are excluded from the PhD programme and lose their scholarships – if any.

In case the Faculty Board holds appropriate to assign directly an exclusion evaluation (Ei) without a previous repetition year, the request must be properly motivated, and validated by the PhD School.

After the final year, candidates who have achieved sufficient results but need more time to draw up their theses, may obtain a prorogation of up to 12 months.

6.6 PhD thesis preparation

The main objective of the PhD career is the development of an original research contribute. The PhD thesis is expected to contribute to the advance of the knowledge in the candidate's research field.

The PhD study and research work is carried out, full time, during the three years of the PhD course. Stages or study periods in (Italian or international) companies or external institutions may complete the candidate's preparation. The resulting theses need to be coherent with the research issues developed in the Department where the PhD programme is developed. The candidate must present an original thesis, discuss its contribution to the state of the art in the research field in the research community. The PhD research is developed following the lead of a supervisor, who supports the candidate in the setting out and in the everyday activities regarding the thesis development.

At the conclusion of the PhD studies, the Faculty Board evaluates the candidates. Candidates who receive a positive evaluation submit their theses to two external reviewers for refereeing. If the evaluation provided by the reviewers is positive (o after the revisions required by the external reviewers), the candidates defend their thesis in a final exam, in front of a committee composed of three members (at least two of which must be external experts).

7. Laboratories, PhD Secretary Services

Secretary Services:

Dr. **Esperia Ferrara**
esperia.ferrara@polimi.it
Phone +39 02/2399.4616

8. Internationalisation and inter-sectoriality

Carrying out study and research activities at external laboratories is strongly recommended. Politecnico di Milano supports joint PhD paths with international institutions, as well as joint and double PhD programmes. Further information is available on the PhD School website and on the PhD programme website.
More specifically, the PhD programme in Mathematical Models and Methods in Engineering collaborates with with Sorbonne Université, Leiden University (Netherlands) to award double degrees. The PhD programme benefits of the project *EU PROJECT 713485,* INdAM-DP-Cofund-2015, see https://cofund.altamatematica.it.
Interaction with and exposure to non-academic sectors provides significant benefits to doctoral candidates as well as to research and innovation intensive employment sectors. Direct exposure to the challenges and opportunities in non-academic sectors of the economy and society at large is fostered by networking, connectivity, inter-sectoral mobility and wide access to knowledge. In particular, the PhD programme in "*Mathematical Models and Methods in Engineering"* collaborates with the following research agencies and/or industrial partners: IIT, ABB, Leonardo Spa, Eni Spa, CNR which support some of the fellowships.

Attachment A1 – PhD Programme Coordinator

Michele Correggi

Academic record:

- 2020–today, Full Professor in Mathematical Physics, Politecnico di Milano;
- 2019–2020, Associate Professor in Mathematical Physics, Scuola Normale Superiore, Pisa;
- 2016–2019, Assistant Professor (RTDb) in Mathematical Physics, "Sapienza" University of Rome;
- 2014–2016, Researcher (RTDa) in Mathematical Physics, Roma Tre University;
- 2004–2014, Postdoctoral Positions: "Sapienza" University of Rome; Roma Tre University (funded by ERC); CIRM (FBK), Trento (partially funded by Istituto Nazionale di Alta Matematica "F. Severi"); Scuola Normale Superiore, Pisa; Erwin Schrödinger Institute, Vienna (funded by ERC);
- 2004, Ph.D. in Mathematical Physics, SISSA, Trieste;
- 2000, M.Sc. in Physics, University of Pisa.

Grants: Principal Investigator of 9 grants; 2014–2017, Principal Investigator of a MIUR FIR 2013 grant of $\sim$ 1 million €.

Training: supervisor of 3 postdocs; advisor of 7 PhD students and of several MSc students.

Publications: 46 publications in international peer-reviewed journals.

Long visits: 2019, Institut Mittag-Leffler, Stockholm; 2014, Center for Advanced Studies (CAS), LMU München; 2013, Research in Pairs at CIRM (FBK), Trento; 2009, Ecole Polytechnique, Palaiseau.

Conferences & invited talks: participant to more than 50 international events; more than 60 invited talks. Invited at: Universität Tübingen; University of Zurich; Fields Institute, Toronto; LPMMC, Grenoble; Universidad del Paìs Vasco, Bilbao; LMU, Munich; ESI, Vienna; Universität Wien; Université de Paris Sud. Invited speaker at: *QMATH15*, UC Davis, 2022; *XXI Congresso dell'Unione Matematica Italiana*, Pavia, 2019; *QMATH13*, GeorgiaTech, Atlanta, 2016; *XVIII International Congress on Mathematical Physics*, Santiago de Chile, 2015. Invited speaker at conferences/workshops in: Oaxaca, Stockholm, Paris, Banff, Aalborg, Bilbao, Toronto, Toulouse, Grenoble, Aarhus, Montréal, Vienna, Munich, Berlin.

Organization: co-organizer of 16 international events, including 3 schools with more than 100 participants; organizer of the Intensive Period "INdAM Quantum Meetings (IQM22)" of 3 months at Politecnico di Milano funded by Istituto Nazionale di Alta Matematica "F. Severi" in 2022. Co-funder of the "Mathematical Challenges in Quantum Mechanics" online seminar.

Referee for several top-rank international journals of mathematics and mathematical physics, for the European Research Council, Ministero dell'Università e della Ricerca, Instituto Nazionale di Alta Matematica "F. Severi" and Deutsche Forschungsgemeinschaft (DFG).

Member of the scientific committee of Poliedra; *member* of the executive council of Seminario Matematico e Fisico di Milano.

Attachment A2 – PhD Faculty Board

NAME	AFFILIATION	SSD - TITLE OF SSD
Prof. Correggi Michele	Dipartimento di Matematica	MAT07 / Fisica Matematica
Prof.ssa Antonietti Paola Francesca	Dipartimento di Matematica	MAT08 / Analisi Numerica
Prof. Catino Giovanni	Dipartimento di Matematica	MAT03 / Geometria
Prof. Ciarletta Pasquale	Dipartimento di Matematica	MAT07 / Fisica Matematica
Prof.ssa Confortola Fulvia	Dipartimento di Matematica	MAT06 / Probabilità e statistica matematica
Prof.ssa Conti Monica	Dipartimento di Matematica	MAT05 / Analisi Matematica
Prof. Fagnola Franco	Dipartimento di Matematica	MAT06 / Probabilità e statistica matematica
Prof. Formaggia Luca	Dipartimento di Matematica	MAT08 / Analisi Numerica
Prof. Grillo Gabriele	Dipartimento di Matematica	MAT05 / Analisi Matematica
Prof. Gazzola Filippo	Dipartimento di Matematica	MAT05 / Analisi Matematica
Prof.ssa Guglielmi Alessandra	Dipartimento di Matematica	SECS-S01 / Statistica
Prof. Lella Paolo	Dipartimento di Matematica	MAT03 / Geometria
Prof. Magli Giulio	Dipartimento di Matematica	MAT07 / Fisica Matematica
Prof. Marazzina Daniele	Dipartimento di Matematica	SECS-S06 / Metodi Matematici dell'economia e delle scienze attuariali e finanziarie
Prof.ssa Marchini Elsa Maria	Dipartimento di Matematica	MAT05 / Analisi Matematica
Prof. Paganoni Anna Maria	Dipartimento di Matematica	SECS-S01 / Statistica
Prof. Perotto Simona	Dipartimento di Matematica	MAT08 / Analisi numerica
Prof. Quarteroni Alfio	Dipartimento di Matematica	MAT08 / Analisi numerica
Prof. Rodaro Emanuele	Dipartimento di Matematica	MAT02/ Algebra

Prof.ssa Sabadini Irene Maria	Dipartimento di Matematica	MAT03 / Geometria
Prof. Sacco Riccardo	Dipartimento di Matematica	MAT08 / Analisi Numerica
Prof.ssa Sangalli Laura	Dipartimento di Matematica	SECS-S01 / Statistica
Prof. Sgarra Carlo	Dipartimento di Matematica	SECS-S06 / Metodi Matematici dell'economia e delle scienze attuariali e finanziarie
Prof. Verani Marco	Dipartimento di Matematica	MAT08 / Analisi numerica
Prof. Verzini Gianmaria	Dipartimento di Matematica	MAT05 / Analisi Matematica
Prof. Zunino Paolo	Dipartimento di Matematica	MAT08 / Analisi numerica

Attachment A3 – PhD Advisory Board

Name	**Affiliation**
Bianchetti Marco	Intesa San Paolo
Chiaromonte Francesca	Scuola Superiore Sant'Anna
Ciancarelli Carlo	Thales Alenia Space
Mantica Stefano	ENI Spa
Mauri Aurelio	Micron Semiconductor Italy