



POLITECNICO
MILANO 1863

PhD School - Politecnico di Milano

Regulations of the PhD Programme in:

Structural, Seismic and Geotechnical Engineering

Cycle XLI

1. General Information

PhD School - Politecnico di Milano

PhD Programme: Structural, Seismic and Geotechnical Engineering

Courses start: September 12, 2025

Location of the PhD Programme: Milano Leonardo

Promoter Department: Department of Civil and Environmental Engineering

Scientific Disciplinary Sectors:

- ICAR/07 – Geotechnics
- ICAR/08 – Structural Mechanics
- ICAR/09 – Structural Engineering

PhD School Website: <https://www.dottorato.polimi.it/en/>

PhD Programme Website: <https://www.dica.polimi.it/phd/?lang=en>

2. General presentation

Structural, Seismic and Geotechnical Engineering (SSGE) encompasses those disciplines and techniques that allow to understand, model and control the behaviour of structural materials, soils, components, structures, infrastructures and buildings, together with their interaction with the environment. This is a highly inter-disciplinary field, deeply rooted in Civil Engineering, but with relevant industrial applications as well: the theoretical and applied study of materials and structures goes along with the analysis of the interaction of the structure with the environment, ensuing from either natural or anthropic activities. Because of their generality, the methods developed in SSGE are fundamental also in other technical-scientific areas, whenever understanding and controlling mechanical aspects is necessary to guarantee both design reliability and structural safety, serviceability as well as durability.

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

Within the context outlined above, the primary objective of this PhD programme is to improve the advancement of knowledge with reference to: (a) innovation in materials and structures and in the methods for the mathematical modelling of their response; (b) safety of structures and infrastructures under design actions and effects, extreme static/dynamic actions and against the deterioration due to

the structure lifecycle, together with the development of simulation methods for the analysis of their response; (c) geomaterials, soil-structure-groundwater interaction and underground structure stability.

This objective is pursued within the framework of the research activities carried out at the Department of Civil and Environmental Engineering of the Politecnico di Milano. For this purpose, PhD candidates are given advanced, research-oriented training, based on the pivotal role of Structural Engineering and on the multi-disciplinary nature of Seismic and Geotechnical Engineering. More specifically, the 3-year curriculum of the PhD programme in Structural, Seismic and Geotechnical Engineering aims at providing the following professional skills that will be developed to a greater or lesser extent according to the interests of the candidate:

- (a) Basic and operative knowledge of the principal, up-to-date methods used in computational mechanics, in order to model and analyse the elastic, inelastic and cyclic behaviour of materials and structures;
- (b) Critical understanding and conscious use of numerical codes, depending on the level of the analysis (micro-, meso- and macro-structural levels);
- (c) Basic and operative knowledge of experimental mechanics, including the most advanced experimental techniques and their instrumentation, in order to test materials, structures and soil, either in a laboratory or on site;
- (d) Knowledge of the most common procedures for test-based identification of parameters characterizing the mechanical properties of materials and for the identification of structural damage (for the assessment of structural safety);
- (e) Exploitation of artificial intelligence tools, specifically machine and deep learning, for feature extraction and decision making, regarding the health monitoring of civil structures and infrastructures, even in the case of uncertain input loading;
- (f) Basic and operative knowledge of the design criteria and socio-economic implications governing any major structural project.

One of the distinctive skills developed during the PhD experience is the ability to transfer knowledge effectively, adapting it to different contexts, audiences, and communication occasions. This skill enables PhD graduates to work effectively in teams and disseminate their research results both within their specific community and to broader, more diverse audiences.

The PhD program aims to help candidates communicate technical information, both orally and in writing, tailored to academic or non-academic recipients. This goal is supported by courses offered by the PhD School, including Technical Communication classes. Additionally, candidates participate in activities promoting experiential learning ('learning by doing'), the typical learning method of the PhD journey.

4. Professional opportunities and job market

The high-level education offered by the PhD programme in Structural, Seismic and Geotechnical Engineering allows PhDs to continue their activity along three paths: (a) in the academic field; (b) within other public or private research institutions or companies with a focus on research and development, in the fields of Civil and Environmental Engineering and Industrial Engineering; (c) professional activities, typically as an independent self-employed professional, in a design office, engineering companies or as a high-level consultant, mainly as a structural analyst or in the field of advanced structural design and monitoring.

The inter-disciplinary approach of the PhD programme allows to exploit the experience gained during the study period in different areas: from the design of large infrastructures to the preservation and restoration of monumental and architectural heritage, from seismic design to geostucture stability, not to mention the many issues in common with several branches of Industrial Engineering (mechanical, aerospace, nuclear and bioengineering).

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.

Admission to the programme follows the evaluation of the candidates' curricula, their motivation letter and their report on the development of a hypothetical PhD research in one of the topics addressed in the call for admission, to be submitted contextually with their application.

5.2 Admission deadlines and number of vacancies

The number of positions is indicated in the Call for admission to the 41st PhD cycle Programmes: <https://www.dottorato.polimi.it/en/>

Scholarships both on general and on specific themes are available, as stated in the call for admission.

6. Contents

6.1 Requirements for the PhD title achievement

The achievement of the PhD title in Structural, Seismic and Geotechnical Engineering requires a study and research activity of at least the equivalent of three years of full-time study, research and development of PhD thesis.

PhD candidates in Structural, Seismic and Geotechnical Engineering must earn a minimum of 25 course credits (see paragraph 6.3 below), and continuously conduct studies and research.

In addition, candidates should attend seminar activities organized by the Department, according to the rules defined by the Faculty Board.

At the beginning of the course, the Faculty Board assigns a tutor to each PhD candidate to advise and assist her/him throughout the overall training programme. The tutor to 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 to develop a research-oriented mind-set in the candidates, with expertise and skills in a specific research topic. To this end, candidates develop a problem-solving capability in complex contexts, including the capacity to perform deep problem analysis, identify original solutions, and evaluate their applicability in practical contexts.

These skills provide the PhD candidates with greater 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 contribution. The PhD thesis must thus contribute to increase the knowledge in the candidate's research field. Besides, being consistent with the research topics developed in the Department where the PhD Programme is carried out.

The original research results are collected in the PhD thesis, where the candidate's contribution is framed in a perspective with respect to the 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 definition of her/his objectives and in the everyday activities related to the thesis development. The supervisor is not necessarily a member of the Faculty Board and could belong to an institution other than the Politecnico di Milano. The supervisor may 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 within their research community. Consequently, both the participation in international conferences and the publication of research results in peer-reviewed journals are encouraged.

The PhD programme favours the candidates' research interactions with other groups in their research community, preferably abroad. Research visits of at least three months are strongly encouraged, to help the candidates to acquire further skills for the development of 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, including courses, seminars, project workshops, laboratories. Teaching activities cover both basic research issues (problems, theories, methods) related to the PhD Programme, and specific research topics more directly connected with the students' theses.

Lectures are usually held in English, except when indicated otherwise. The PhD programme includes at least one complete path delivered in the English language.

Structured teaching activities allow to earn ECTS credits. Other scientific activities, more specialised and difficult to evaluate, are taken into account by the Faculty Board for the overall evaluation, but do not allow earning ECTS.

The table below summarizes the candidate's **activity plan** (coursework). At the same time, candidates should also focus on research under the direction of their supervisor as well as of the Faculty Board.

First/Second Year

<i>Courses</i>	<i>Reference</i>	<i>Number of credits</i>	<i>Notes</i>
<i>PhD School Courses</i>	https://www.dottorato.polimi.it/en/phd-school/phd-level-courses	At least 10	- At the beginning of the year, PhD students submit their study plan, which is subjected to the prior authorization of both the tutor and the Faculty Board.
<i>Courses characterising the PhD programme</i>	TABLE A	At least 15	- Changes of the study plan are allowed upon authorization of the Faculty Board.
<i>Other PhD courses</i>	Courses from other PhD programmes held at Politecnico or other scientific institutions		- Credits are earned only by passing the exam. - At least 15 credits are required to proceed into the second year.

Third year

In the third year, the candidate's activity should be devoted entirely to research and to the development of the PhD thesis.

PHD SCHOOL COURSES

The PhD School of Politecnico di Milano offers 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 PhD School courses activated for the 2023-2024 Academic Year are summarized in the following table.

TITOLO INSEGNAMENTO	DOCENTE TITOLARE	ECTS
ADVANCED INTERACTION SKILLS FOR ACADEMIC PROFESSIONALS	ARNABOLDI MICHELA	5
COMMUNICATION STRATEGIES THAT SCORE IN WORLDWIDE ACADEMIA	CONCI CLAUDIO	5
CREATIVE DESIGN THINKING	CANINA MARIA RITA	5
DIGITAL HUMANISM	SCHIAFFONATI VIOLA	5
ENGLISH FOR ACADEMIC COMMUNICATION	BISCARI PAOLO	5

ETHICAL ASPECTS OF RESEARCH ON DUAL-USE TECHNOLOGIES	MASARATI PIERANGELO	5
ETHICS OF ARTIFICIAL INTELLIGENCE	ROCCHI DANIELE	5
HOW TO SUPPORT COMPLEX DECISIONS: APPROACHES AND TOOLS	OPPIO ALESSANDRA	5
INDUSTRIAL SKILLS	BISCARI PAOLO	5
INNOVATIVE TEACHING SKILLS	BRUNETTO DOMENICO SAVIO	5
INTRODUCTION TO ACADEMIC RESEARCH	VOLONTE PAOLO GAETANO	5
LA COMUNICAZIONE NELLA SCIENZA	PAGANONI ANNA MARIA	5
POWER OF IMAGES AND VISUAL COMMUNICATION FOR RESEARCH DISSEMINATION	IAROSI MARIA POMPEIANA	5
PRACTICING RESEARCH COLLABORATION	PIZZOCARO SILVIA LUISA	5
PROFESSIONAL COMMUNICATION	DI BLAS NICOLETTA	5
PROJECT MANAGEMENT (IN ACTION)	MANCINI MAURO	5
PROJECT MANAGEMENT BASICS	FUGGETTA ALFONSO	5
RECORDING WORK 4 BUILDING MEMORY: METHODS, PRACTICES, TOOLS, SKILLS TO MANAGE THE KNOWLEDGE	BOERI ELISA	5
RESEARCH COMMUNICATION. ISSUE MAPPING: EXPLORING PUBLIC DEBATES SURROUNDING ACADEMIC TOPICS	COLOMBO GABRIELE	5
RESEARCH SKILLS	BISCARI PAOLO	5
SCIENCE DIPLOMACY FOR RESEARCHERS. FILLING THE GAP BETWEEN SCIENCE AND POLICY WITHIN THE GLOBAL CHALLENGES	SHENDRIKOVA DIANA	5
SCIENCE, TECHNOLOGY, SOCIETY AND WIKIPEDIA	RAOS GUIDO	5
SCIENTIFIC/ACADEMIC ENGLISH: WRITING AND PRESENTING WITH AND WITHOUT THE SUPPORT OF LLMS	JACCHETTI EMANUELA	5
SCIENTIFIC COMMUNICATION IN ENGLISH	BISCARI PAOLO	5
STRENGTHENING CRITICAL SPATIAL THINKING	ARMONDI SIMONETTA	5
SULLA RESPONSABILITÀ ETICA DELLA TECNICA	OSSI PAOLO MARIA	5
SUSTAINABILITY METRICS, LIFE CYCLE ASSESSMENT AND ENVIRONMENTAL FOOTPRINT	LAVAGNA MONICA	5
TEACHING METHODOLOGIES, STRATEGIES AND STYLES	SANCASSANI SUSANNA	5
THE COPERNICUS GREEN REVOLUTION FOR SUSTAINABLE DEVELOPMENT	OXOLI DANIELE	5

At least 10 of the 25 course credits that each candidate is required to earn will be obtained through soft and transferable skills courses organized by the PhD School.

EVALUATIONS

After attending a course, PhD students should pass an exam, whose form (oral, written test or written essay) will be defined by the end of the course by the professor in charge.

COURSE PROGRAMMES

For information about the course programmes (content and calendar), please refer to https://www11.ceda.polimi.it/manifestidott/manifestidott/controller/MainPublic.do?check_params=1&k_cors_o_la=1384&lang=EN&polij_device_category=DESKTOP&_pj0=0&_pj1=abcc846e9d0abdf0f7c88a6d6b009757

PhD programme Website:

<https://www.dottorato.polimi.it/en/phd-programmes/engineering/structural-seismic-and-geotechnical-engineering>

COURSES CHARACTERISING THE PHD PROGRAMME

The PhD Programme in Structural, Seismic and Geotechnical Engineering organises the Characterising Courses listed in table A. This list may change during the year. Additional courses may be attended by the students of the 39th cycle during their second year.

Table A: COURSES CHARACTERISING THE PHD PROGRAMME

GHISI	ALDO FRANCESCO	ADVANCED TOPICS IN THE FINITE ELEMENT METHOD FOR STRUCTURAL ANALYSIS	5.00
CHAPLAIN	GREGORY JAMES	COMPLEX WAVE PHENOMENA IN METAMATERIALS AND TOPOLOGICAL MECHANICS	4.00
DE PONTI	JACOPO MARIA		1.00
PAOLUCCI	ROBERTO	<u>ELASTIC WAVE PROPAGATION WITH APPLICATIONS TO EARTHQUAKE ENGINEERING</u>	5.00
STERPI	DONATELLA VALERIA	ENERGY GEOSTRUCTURES	5.00
GALLI	ANDREA	<u>ENGINEERING MODELS FOR MULTISCALE SOIL-STRUCTURE INTERACTION PROBLEMS</u>	5.00
FELICETTI	ROBERTO	EXPERIMENTAL METHODS IN MATERIAL AND STRUCTURAL MECHANICS	5.00
FEDELE	ROBERTO	<u>INVERSE PROBLEMS AND FINITE ELEMENT MODEL UPDATING</u>	5.00
BIONDINI	FABIO	<u>LIFE-CYCLE RELIABILITY, ROBUSTNESS, RESILIENCE, AND RISK OF BRIDGES AND INFRASTRUCTURE NETWORKS</u>	5.00
DI PRISCO	MARCO	PERFORMANCE, PROTECTION & STRENGTHENING OF STRUCTURES UNDER EXTREME LOADING (SUMMER SCHOOL 2025)	5.00
ENTEZAMI	ALIREZA	STRUCTURAL HEALTH MONITORING USING CLASSIC AND DATA SCIENCE TECHNIQUES	3.00
MARTINELLI	LUCA		2.00

OTHER PHD COURSES

In addition and/or in alternative to those listed in Table A, students may attend PhD courses offered by other PhD programmes of the Politecnico and/or by external institutions, such as CISM (www.cism.it) or Rose School (www.roseschool.it). In this case, the prior approval of both the tutor and the Coordinator is mandatory.

Minimum requirements

- 1) The minimum number of credits to be acquired from the list in Table A of Courses Characterising the PhD Programme or from Other PhD Courses is 15. Master courses activated at the Politecnico di Milano can be assimilated to PhD courses provided that they belong to scientific areas not fully covered by the courses offered by the PhD Program in Structural, Seismic and Geotechnical Engineering. In which case, the proposed course must be approved by the Faculty Board.
- 2) The minimum number of credits to be acquired from the list of PhD School Courses is 10.
- 3) The minimum number of credits to be acquired in the first year is 15.

Each candidate must experiment three modes of technical-scientific communication:

1. Oral presentation to experts in the field and topic, aimed at developing the ability to communicate advanced content within a limited timeframe, highlighting key aspects of the research/project and justifying methodological choices, to an audience with high evaluation skills. This experience, aimed at sharing projects among colleagues, is achieved by participating in at least one conference or workshop where research results are presented.
2. Oral presentation to stakeholders with expertise in the field but not in the specific topic, transferring contents with appropriate details in unlimited timeframes. This skill, aimed at the ability to transfer research/project content to non-expert collaborators, is gained through specific training experiences with specific goals and typical timelines of academic and corporate settings.
3. Written communication for a community of experts. This skill is aimed at the ability to organize the document content, shorter than a book or thesis but still broad in scope, with an appropriate level of technical-scientific detail. This mode, typical of internal reports or technical notes, is experienced by creating written documents addressed to a relevant scientific community such as scientific or technical articles.

Each candidate is required to participate as a speaker in at least one international conference or workshop, complete at least one training activity, and publish at least one scientific or technical contribution aimed at an expert community. Any exceptions must be justified and authorized by the Faculty Board.

PREPARATORY COURSES (only if foreseen)

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

SPECIALISTIC COURSES, LONG-TRAINING SEMINARS

Attending special courses and summer schools is strongly encouraged. Where they are certified and evaluated, attendance may allow students to obtain credits, as established by the Faculty Board and with prior approval of the study plan. Courses with certified attendance can be added to the study plan

as optional “extra teaching activities”, even if they are not evaluated and therefore cannot be qualified as credits.

Other courses may be activated during the year. In which case, the candidates will be promptly informed and will be allowed to insert these new courses in their study plan.

6.4 Presentation of the study plan

PhD candidates are required to submit a study plan, which may be revised periodically (approximately every three months) to add new courses or to reflect developments in their PhD career. The study plans must be approved by the PhD programme Coordinator, following the procedure established by the Faculty Board.

6.5 Yearly evaluations

Candidates present their work to the Faculty Board at least once a year. 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 defence.

As a result of each annual evaluation, the candidates passing the exam receive an evaluation (A/B/C/D) and may proceed with the enrolment for 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 once at most. 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 cases where the Faculty Board retains it 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 conclude their research work and write their theses may obtain the admission to a further year.

Candidates will be given guidelines by which to prepare their presentations for the yearly evaluations and the admission to the final exam.

6.6 PhD thesis preparation

The main objective of the PhD career is the development of an original research contribution, consistent with the research objectives of the Department where the PhD programme is developed. The PhD thesis is expected to contribute to the advancement of the knowledge in the candidate's research field.

The originality of her/his work and its role for the improvement of the state-of-the-art should be highlighted in the candidate's thesis.

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 (or after the revisions required by the external reviewers), the candidates defend their thesis in a final exam, in front of a Commission composed of at least three members (at least two of them must be external experts).

7. Laboratories, PhD Secretary Services

7.1 Experimental facilities

Advanced experimental research activities related to structures, materials and geotechnics are mostly supported by the Testing Lab for Materials, Buildings and Civil Structures (see website: <http://www.lpm.polimi.it/>), which is an officially accredited Lab for testing structures and structural elements with forces ranging from 0.01 to 5000 kN, as well as to conduct physical/mechanical tests on structural and geomaterials, both in standard and high-temperature conditions. Experimental facilities are also available on the Lecco Campus, and these are mainly devoted to the investigation of impact loads and advanced cementitious composites.

PhD students are strongly encouraged to perform experimental activities: the visits to the lab and the scheduled courses on Experimental Structural Mechanics serve this purpose.

7.2 Computational resources

PhD students have a personal computer for their own use.

For computing applications, a number of high-performance servers dedicated to PhD students is available. It is also worth mentioning that Politecnico di Milano is partner of the consortium CINECA (www.cineca.it), which hosts one of the most powerful supercomputers in the world.

7.3 PhD Secretariat services

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8. Internationalisation and inter-sector activities

Conducting study and research activities in external laboratories is strongly recommended. The 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 Structural, Seismic and Geotechnical Engineering has established agreements of Double/Joint PhD Degree with the following institutions:

Université Paris-Saclay, Paris – France

Double PhD Degree

Budapest University of Technology and Economics (BUTE) – Hungary

Joint PhD Degree.

University of Kurdistan – Iran

Double PhD Degree

Tongji University – P.R. China

Double PhD Degree

Pontificia Universidad Católica de Chile

Double PhD Degree

University of Iceland

Joint PhD Degree

Scientific collaborations are also active with:

Joint Research Centre, Ispra – Italy

The PhD programme in Structural, Seismic and Geotechnical Engineering works together with the Ispra Joint Research Centre and, in particular, with the ELSA Lab (European Laboratory for Structural Assessment). Several PhD students have taken part in experimental activities within international research projects for thesis-related purposes.

Universitat Politècnica de Catalunya, Barcelona – Spain

Numerous joint research activities together with the UPC have been successfully carried out in the past years, especially in the geotechnical sector. Exchanges of PhD students and researchers have contributed to foster both PhD and research activities.

Université Grenoble Alpes – France

The collaboration between this university and the PhD programme in Structural, Seismic and Geotechnical Engineering began several years ago and has led to a rising number of visits, exchanges and collaborations on joint research projects, in particular with the Institut des Sciences de la Terre and the Laboratoire 3SR Sols, Solides et Structures, Risques.

Delft University of Technology – The Netherlands

The collaboration with the Delft University of Technology focuses on computational mechanics and the physical, numerical and theoretical modelling of the behaviour of porous materials.

A member of PhD Faculty Board has spent her sabbatical in Delft, where she has worked on the generation of fractures in porous materials, their hydro-mechanical characterization and flooding risks.

Interaction with and exposure to the non-academic sector is beneficial for doctoral candidates as well as for research and innovation-intensive employment sectors. Involvement in the challenges and opportunities of the non-academic sector of the economy and society is fostered by networking, connectivity, inter-sectorial mobility and wide access to knowledge.

In particular, the PhD programme in Structural, Seismic and Geotechnical Engineering collaborates with the following research agencies and industrial partners: STMicroelectronics; Tetra Pak Packaging Solutions; Italcementi; Lombardi Italia; Arup.

***STMicroelectronics** is a joint Italian-French multinational company with more than 50.000 employees. Since 2000 STMicroelectronics Italia has been researching and implementing the industrial production of Micro Electro Mechanical Systems (MEMS), thanks to its strong focus on R&D.

The collaboration with STMicroelectronics Italia mainly focuses on the following themes: MEMS mechanical reliability; mechanical characterization on the micro-scale; study and modelling of accidental impact; study of dissipative phenomena; study of stiction-related problems; study and planning of resonant machines and magnetometers; study of energy harvester systems; study of innovative micro-systems for the measurement of angular velocity (micro-gyroscopes); piezoelectric MEMS.

***Tetra Pak Packaging Solutions** is part of the Tetra Laval Group, founded in 1951 in Sweden, which provides innovative processing and packaging solutions for food products.

***Italcementi**, founded in 1864 and now owned by the German Heidelberg Cement, is the number 1 in aggregates production, the number 2 in cement and number 3 in ready-mixed concrete worldwide.

***Lombardi Italia**, founded in 1955 as consulting company for engineering services, cares for the life cycle of transport infrastructures and hydraulic works from the initial design phases to their operation.

***Arup** is an independent firm of designers, planners, engineers, technical specialists and consultants, which has been offering multidisciplinary professional services since 1946 and is now worldwide.

***Innovhub**, is a company conducting research activities, technical and scientific consulting and industrial testing in the field of paperboard, combustibles, oil and grease and silk. Joint research activities are in progress, with special reference to paperboard. A PhD scholarship has been partially sponsored by Innovhub to carry out research on the nonlinear behavior of paperboard during creasing and folding.

Attachment A1 – PhD Programme Coordinator

Prof. DARIO CORONELLI

EDUCATION AND ACADEMIC DEGREES

1993: "Laurea" (Master degree) in Civil Structural Engineering at the Politecnico di Milano

1994: Professional qualification, Civil Engineer

1998: Doctorate in Structural Engineering at the Politecnico di Milano.

EMPLOYMENT HISTORY

1999: Research Assistant, Dept of Structural Engineering, Politecnico di Milano, research supervisor Prof. Pietro G. Gambarova

2001: Assistant Professor of Structural Analysis and Design at the Politecnico di Milano

2014: Associate Professor of Structural Analysis and Design at the Politecnico di Milano.

2024: Professor of Structural Analysis and Design at the Politecnico di Milano.

TEACHING

Courses in Bachelor and Master Degrees, School of Civil Environmental Engineering and School of Architecture, Urban Planning and Construction Engineering, Politecnico di Milano

Courses in the PhD School, ISSG doctorate, Politecnico di Milano.

SCIENTIFIC COMMITTEES

2021 to present: Convener of fib COM3 TG32 Modelling of structural performance of existing concrete structures (member since 2017) - <https://www.fib-international.org/commissions/com3-existing-concrete-structures.html>. The more relevant products are:

2022-present: Secretary of the Italian group for the preparation of CNR DT "Linee guida per la valutazione della resistenza e della vita residua di opere in ca e cap soggette a corrosione" (Guidelines for the assessment and residual service life of reinforced and prestressed concrete structures with corrosion attack") chairs M. Di Prisco and B. Belletti.

2014-present Associate Member of ACI Committee 364 "Rehabilitation of Concrete Structures"

2012-2017 member of fib SAG7 "Assessment of Existing Structures", Work Group B "Modeling of structural performance of existing structures", chairs J. Walraven and Stuart Matthews

2017-present: Member of fib TG 2.5 Bond and Material models, coordinating the preparation of MC2020 on Bond and corrosion.

2015-present: Voting Member ACI Committee 421 “Design of Reinforced Concrete Slabs”

ORGANIZATION OF INTERNATIONAL CONFERENCES

CACRCS Days “Capacity Assessment of Corroded Reinforced Concrete Structures”. Co-organizer with B.Belletti of four editions of the International Workshop.

AREAS OF SCIENTIFIC ACTIVITY

The research activity has been mainly carried out in the fields of: assessment of corroded concrete structures, assessment of historical masonry structures, testing and design of reinforced concrete structures, seismic testing and design of reinforced concrete slabs.

PUBLICATIONS

Over 150 papers in international peer reviewed journals and conferences

3 technical design guides

2 publications for teaching

AWARDS

2023 CACRCS Workshop Award as the Best presentation by an Experienced Researcher.

2020-2023 Stanford database of 100,000 top-scientists

Attachment A2 – PhD Faculty Board

Description of the composition of the Faculty Board

Name	Affiliation	SSD / Title of SSD
Coronelli Dario (Coordinator)	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/09 - Structural Engineering
Ardito Raffaele	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/08 – Structural Mechanics
Bamonte Patrick	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/09 - Structural Engineering
Biondini Fabio	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/09 - Structural Engineering
Bolzon Gabriella	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/08 – Structural Mechanics
Bruggi Matteo	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/08 – Structural Mechanics
Comi Claudia	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/08 – Structural Mechanics
Corigliano Alberto	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/08 – Structural Mechanics
Cremonesi Massimiliano (Vice-Coordinator)	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/08 – Structural Mechanics
Della Vecchia Gabriele (Vice-Coordinator)	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/07 – Geotechnics
Di Prisco Claudio	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/07 – Geotechnics
Di Prisco Marco	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/09 - Structural Engineering
Felicetti Roberto	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/09 - Structural Engineering
Ferrara Liberato	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/09 - Structural Engineering
Frangi Attilio Alberto	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/08 – Structural Mechanics
Ghisi Aldo	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/08 – Structural Mechanics
Jommi Cristina	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/07 – Geotechnics
Lualdi Maurizio	Politecnico di Milano - Department of Civil and Environmental Engineering	GEO/11 –Applied Geophysics
Mariani Stefano	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/08 - Structural Mechanics

Martinelli Luca	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/08 – Structural Mechanics
Muciaccia Giovanni	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/09 - Structural Engineering
Paolucci Roberto	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/09 – Structural Engineering
Perego Umberto	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/08 – Structural Mechanics
Petrini Lorenza Maria	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/08 – Structural Mechanics
Smerzini Chiara	Politecnico di Milano - Department of Civil and Environmental Engineering	ICAR/09 - Structural Engineering

Attachment A3 – PhD Advisory Board

Description of the composition of the Advisory Board

Name	Affiliation
Albert Luigi	Soil Geotecnica, Milano
Beltrami Carlo	Lombardi Ingegneria, Milano
Borsari Roberto	Tetra Pak. Packaging Solutions S.p.A.
Cena Francesca	Cena Interpipes Srl
Frigerio Antonella	RSE
Mazzà Guido	ITCOLD
Negro Paolo	JRC, Ispra
Scuri Silvia	Artech srl, Milano
Teora Maurizio	Arup Italia
Zambon Massimo	Techint, Milano
Zirpoli Ada	Harpaceas, Milano