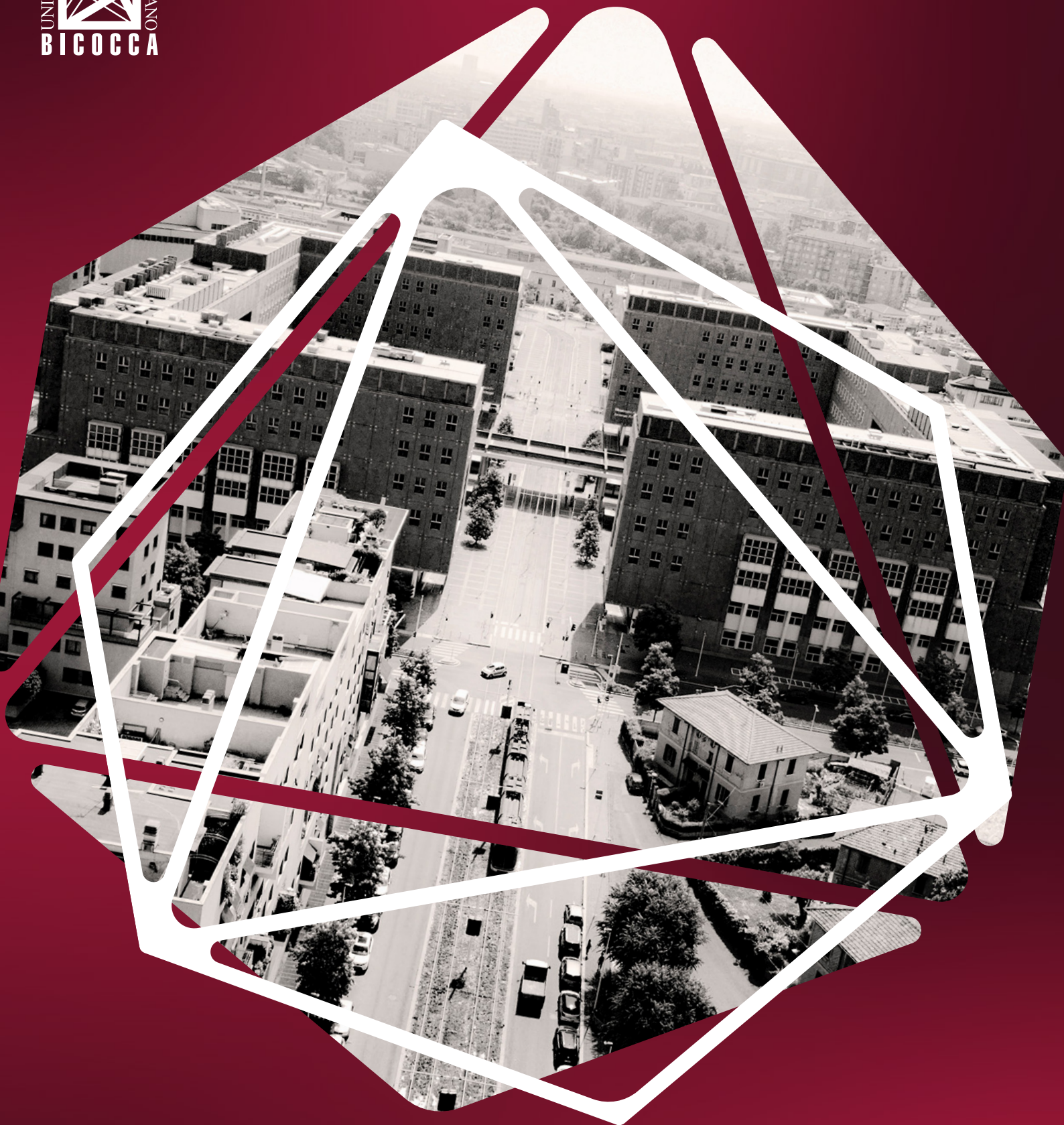
UNIVERSITÀ DEGLI STUDI DI MILANO BICOCCA



PhD School

Programmes catalogue

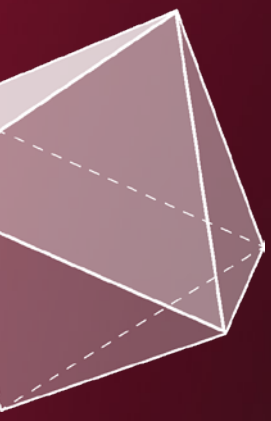
PhD School Programmes catalogue

Editorial and graphic design by Marta Costantino
Settore Stampa e comunicazione | Ufficio eventi istituzionali e grafica

University of Milano-Bicocca

Founded in 1998, the University of Milano-Bicocca has grown rapidly to become a central figure in the international higher education and research landscape. The University's modernity is reflected in its innovative approach to teaching and its commitment to fostering an inclusive and future-oriented academic environment.

Located in the northern part of the city, in an area specifically designed as an educational and research hub, the University benefits from state-of-the-art facilities and a strategic location. The Bicocca district has been designed to integrate educational institutions, research centers, and industry, creating an ecosystem that fosters collaboration and innovation. The Biomedical Hub of the Department of Medicine and Surgery is located in Monza to be close to the IRCCS San Gerardo dei Tintori Foundation, the centre for healthcare and clinical research focused on personal health, where students carry out their professional training activities.



Campuses

The Milan and Monza poles of the Campus

The University of Milano-Bicocca was founded on the *Campus* concept. The two poles in Milan and Monza are organised into large spaces where teaching, research and services facilities are fully integrated. These include technologically advanced lecture theatres, study rooms, research centres, computer and research laboratories, and extensive libraries.

Support services are integrated into the neighbourhood and include canteens, bars, residences, auditoriums, gyms, the Bicocca Stadium, and ample parking.

The BioMedical Campus (Monza)

The Department of Medicine and Surgery is located in Monza in order to maintain a close relationship to the San Gerardo Clinic Hospital, which is the seat of care and clinical research activities aimed at personal health. The Biomedical Campus includes other healthcare facilities in the Lombardy region, where students carry out their professional training activities (internships).

Alcyoneum (MaRHE Center, Maldives)

The University is also present on the island of Magoodhoo in the Maldives archipelago with the Marine Research and High Education (MaRHE) Center. Here, researchers collaborate with Maldivian colleagues to study innovative solutions for sustainable development, and students can spend periods of mobility for study and/or research purposes.

Rankings

Milano-Bicocca consistently participates in the *Times Higher Education World University Rankings* and the *THE Young University Rankings*. The latter specifically highlights qualities of institutions under 50 years old, focusing on performance indicators rather than long-term historical reputation.

Every year *THE* publishes its ranking of the best universities in the world based on factors such as teaching quality, research volume, international outlook, academic reputation, and the staff-to-student ratio.

The PhD School

Established in 2014, the PhD School currently delivers **21 PhD programmes across 7 disciplinary areas** (Economics and Statistical Sciences, Law, Medicine and Surgery, Psychology, Educational Sciences, Natural Sciences, Sociology). It hosts approx. 900 students (over 15% of whom are international) and more than 500 faculty members (national and international).

Since its creation, the PhD School has focused on expanding its links with national and international companies as well as with non-profit sector and has signed more than 300 agreements in recent years for PhD positions in collaboration with companies. It promotes internationalisation and entrepreneurship by:

- signing agreements with foreign Universities leading to dual degree titles/cotutelle;
- participating in MSCA Doctoral Network;
- being a member of the EUA-CDE (European University Association-Council for Doctoral Education);
- collaboration with Assolombarda, the association of companies in the Lombardy region.

The School provides comprehensive administrative support from admission to the awarding of the degree and organizes multiple interdisciplinary courses in English for all students, covering:

- Language and Communication
- Technological Skills
- Transversal Skills
- Research Management and Funding
- Interdisciplinary Pathways
- Green Skills

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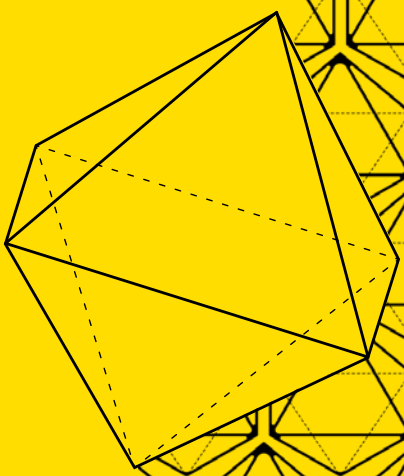


Economics and statistical Sciences

Economics, Statistics and Data Science (ECOSTATDATA)

The PhD Programme in Economics, Statistics and Data Science (ECOSTATDATA) is affiliated with the Department of Economics, Management and Statistics at the University of Milano-Bicocca. It is a four-year programme structured into three curricula: Economics, Statistics, and Big Data & Analytics for Business.

The programme provides rigorous training in microeconomics, macroeconomics, econometrics, international economics, game theory, experimental economics, computational statistics, stochastic processes, inferential and Bayesian statistics, structured and unstructured data analysis, data visualization, machine learning, text and web mining, and complex data methods.

During the first year, students attend a set of core "structured" courses. In the second year, teaching activities take place through reading groups, aimed at developing students' critical understanding of selected research articles. From the second year onward, students are required to design and develop their own research projects.

Mission and topics covered

The mission of ECOSTATDATA is to capitalize on the natural interaction among economists, statisticians and data scientists at the University of Milano-Bicocca, and to transfer this body of knowledge and expertise to highly motivated students.

Students can build flexible academic profiles suited for scientific research careers in universities and in national or international research institutions. ECOSTATDATA also provides innovative training paths targeted at the non-academic job market.

High research standards are ensured by a first-class Faculty. Moreover, ECOSTATDATA is developing a network of national universities and international PhD programmes.

Career opportunities

ECOSTATDATA trains highly skilled young researchers who find career opportunities in:

1. academia and research centers;
2. economic institutions and regulatory authorities;
3. national and international companies specializing in data analytics;
4. consulting firms and organizations operating in quantitative finance.

Based on data from the 34th (2018–19), 35th (2019–20) and 36th (2020–21) cycles, two-thirds of PhD graduates have secured positions as assistant professors or research fellows in universities and research centers in Italy and abroad. Graduates who pursued non-academic careers work in national and international public institutions and authorities, European banks, and consulting companies.

Learn more

B4S
Business for society

In a rapidly evolving economic, technological, and social landscape, the PhD Programme in Business for Society (B4S) trains researchers capable of analysing, interpreting, and guiding the profound transformations that shape the relationships between firms, institutions, and society. The programme provides an international and interdisciplinary research environment where doctoral candidates develop advanced competencies in strategy, innovation, sustainability, entrepreneurship, organisation, and public value creation. B4S fosters an open, critical, and collaborative scientific culture. Through interaction with scholars, professionals, and external partners, students are encouraged to produce research that addresses contemporary challenges and contributes to the development of organisational and institutional models that are more equitable, resilient, and sustainable.

Mission and topics covered

The mission of the B4S PhD Programme is to generate knowledge that creates value for society, by training researchers and professionals who integrate scientific rigour, innovation, and social responsibility.

The programme aims to:

- conduct advanced and theoretically grounded research in management, economics, and applied social sciences;
- develop interdisciplinary skills that enable the study of complex and high-impact problems;
- promote sustainable innovation through research that combines creativity, economic impact, and social relevance;
- build an international community of scholars engaged in collaboration with universities, firms, institutions, and civil-society organisations;
- train responsible researchers able to foster inclusion, sustainability, and societal progress.

The vision of the B4S PhD Programme is to develop a new generation of scholars and leaders able to imagine, design, and support economic, organisational, and institutional models that combine innovation, competitiveness, and social value.

Key research areas include:

- strategic management and business model innovation;
- sustainability, ESG practices and corporate social responsibility;
- entrepreneurship, innovation ecosystems and digital transformation;
- public value, social innovation and impact measurement;
- sustainable finance and innovative financial instruments;
- organisational change, hybrid work and people analytics.

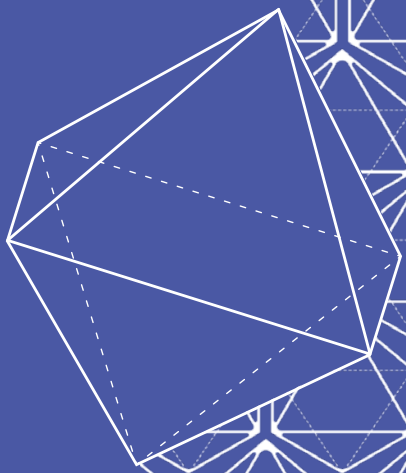
Career opportunities

Graduates from the B4S programme develop advanced methodological skills, analytical capabilities, and strategic vision that open a wide variety of career paths. Typical opportunities include:

- academic and research positions in universities and international research centres;
- managerial roles in firms focused on strategy, innovation, and sustainability;
- positions in R&D, corporate strategy, innovation management, and ESG/CSR;
- strategic consulting, impact assessment, and policy analysis;
- roles in public organisations, international institutions, think tanks, and NGOs;
- entrepreneurial careers in technology-based or social-impact ventures;
- industrial PhD opportunities and projects conducted in collaboration with partner companies.

Graduates combine academic excellence, critical thinking, and the ability to work in complex settings, contributing to value creation across private, public, and social-sector organisations.

Learn more



Law

Legal Sciences

The PhD Course in Legal Sciences is aimed at Law graduates who have an interest in deepening their studies in the legal field, both in its national and international dimensions. The Course provides students with a wide and varied spectrum of scientific tools necessary for the education of jurists and for the comprehension of Law.

Mission and topics covered

Joining this PhD programme means becoming part of an active and wide community of scholars, having access to an advanced study course, strongly focused on an interdisciplinary perspective and devoted to fully understanding the existing interconnections between different legal systems, thereby enhancing the candidate's critical analysis and expertise in one of 5 areas:

- **Business, Tax, and Labour Law:**
  interdisciplinary focus on commercial, tax, labour, and comparative private law.
- **Criminal Justice & Rights:**
  explores criminal law, rights, and policy from historical and procedural perspectives.
- **Private Law & Protection:**
  studies civil law, Roman law, and legal history to address modern issues in private autonomy and protection.
- **Powers, Rights, and Democracy:**
  examines constitutional, public, and administrative law, with a focus on governance and fundamental rights.
- **International & EU Law, Legal Philosophy:**
  advances research in international law, EU law, and legal philosophy with a multidisciplinary approach.

Career opportunities

Beyond preparing students for the traditional legal professions (lawyers, judges and notaries) and an academic career, the PhD Course prepares students for employment in management roles in the local and national administrations and in European and international institutions.

It also prepares students for highly-qualified roles in the private sector, e.g. counselling activities in the industrial and commercial fields. The PhD diploma entitles its holder to register directly for the Italian judiciary competitive exam.

Learn more

The New Public Administration: data and human resources

The PhD program in "The new public administration: human capital & data", in line with the objectives of the National Recovery and Resilience Plan (NRRP), is designed for those who wish to apply for a top level or high professional employment in the public sector.

The doctoral program is organized in association between the Universities of Milan Bicocca, Turin, and Bergamo.

Mission and topics covered

The PhD program lasts three years and is structured into 2 curricula, with a strong multidisciplinary connotation:

- selection, management and enhancement of human capital in public organizations;
- data, policies and services in public organizations.

The PhD program consists of an initial training common to both curricula in the first year and specific curricular teaching in the second and third year of the programme. The doctoral students are required to spend a period abroad in a scientific institution (minimum 6 months/maximum 18 months). The curriculum of studies has been designed ad hoc and developed with the contribution of the other Universities involved in the PhD programme. Courses are offered both in Italian and/or English and might be integrated with classes belonging to other UNIMIB doctoral courses.

Career opportunities

This PhD programme aims to train high skilled professional (in Italian *Elevata Professionalità – EP*, which means *high professionality*) and young talents that can pursue a successful career in any type of public organization, spanning from the State to regional and local government and including public organizations active in many policy fields such as for example health, education & research, culture & tourism, environment, police & safety, welfare, economic regulation & economic development.

Other relevant career opportunities might be in international and non-governmental organizations as well as in no profit, social enterprises and companies working with public organizations. A career in research and/or training institutions might also be an opportunity.

Learn more

Medicine and Surgery

Translational and Molecular Medicine – DIMET

The PhD Program in Translational and Molecular Medicine (DIMET) is an inter-departmental program aimed at promoting the application of basic and applied research in clinical settings.

The cultural challenge of the post-genomic era hinges on the understanding of the cellular and molecular mechanisms at the basis of human diseases in order to design new therapeutic strategies. This goal requires professional profiles with a robust background in basic research, but also skills in bridging the gap between laboratory and clinical investigation. DIMET is aimed at the increasing demand for such new models of innovative inter-sectorial training programs in Biomedicine, in line with the EU Horizon Europe.

Mission and topics covered

DIMET organises coordinated and cross-disciplinary training to form highly-qualified PhDs and MDs with potential bench-to-bedside round trips. The participation in DIMET of private Research Institutes exposes students to different research environments, approaches and methodologies. DIMET students are strongly encouraged to spend a period abroad to improve their research and promote students' international networking. To this end, DIMET participates in international educational programs, such as Marie Curie Actions.

The DIMET program covers three main interconnected areas:

- Cellular and molecular mechanisms
- Clinical and regenerative medicine
- Technological platforms, nanomedicine and diagnosis

Career opportunities

DIMET builds *translational* professional profiles that possess a strong foundation in basic research and the critical ability to rapidly transfer new knowledge from basic sciences to biomedicine. The ultimate goal is to generate cutting-edge, advanced diagnostic and therapeutic applications. Graduates are therefore well-suited for careers in public or private sector research, biotechnology enterprises, and agencies operating at the interface of basic research and healthcare delivery.

Learn more

Neuroscience

The PhD program is an interdepartmental, multisite enterprise based at the School of Medicine and Surgery of the University of Milano-Bicocca. The mission is to provide an environment of excellence for training in neuroscience research established on the coexistence and cooperation of Italian and International Universities, Hospital-based research center and Industry with a strong vocation to innovation. This program fosters collaboration between academic and industrial researchers and clinicians across all aspects of modern Neuroscience. The PhD program is structured into 2 tracks: Experimental and Clinical.

Mission and topics covered

The PhD program offers an international, multidisciplinary, environment comprising neurobiology, neuropharmacology, neuropsychology and clinical sciences (neurology, neuro-oncology, neurosurgery, psychiatry, psychology and neurorehabilitation) and collaborates with the industrial sector. This network gives access to different technological platforms including OMICS and *in vitro* imaging and clinical and preclinical *in vivo* diagnostic devices.

The Experimental track is aimed at understanding the biological mechanisms and pathogenesis of diseases using animal or cellular models or ex-vivo patient's specimens. Identification of novel therapeutics or diagnostic are also included in research programs. **The Clinical track** focuses on the understanding of the mechanism of brain functions in normal condition or in brain disorders, and the use of specific strategy for functional recovery.

The core of the program is the development of student autonomy, guided by supervisors and the faculty board, through diverse basic, clinical, methodological, translational and interdisciplinary research projects fostering a comprehensive understanding of modern Neuroscience. The curriculum includes broad interdisciplinary courses and seminars detailed in the web site.

Career opportunities

PhD training in Neurosciences offers the opportunity to experience different laboratories, operating in academic as well as non-academic institutions, employing innovative technology and scientific approach. This experience leads to a career not only in academia but also in non-clinical and clinical R&D activities in Biotech, Pharma, Medical Device companies dedicated to neuroscience or neurosciences-based products as well as Contract Research Organization (CRO).

Finally, for MD specialists, psychologists, or physiotherapists, the integrated, international and interdisciplinary training provides a rare opportunity for personal and professional growth, fostering the application of innovative approach in clinical practice in private or public medical institutions.

Learn more

Nursing and Midwifery

The PhD programme in Nursing and Midwifery aims to advance the development of new knowledge, theories, methods, tools, and interventions in the field. Its ultimate goals are to promote, maintain, and restore individual and communities wellbeing, to deliver effective, evidence-based, and personalized care, and to reduce suffering across all life stages. Nursing and Midwifery research can offer key contributions to clinical practice, organizational development, and educational innovation.

Mission and topics covered

This PhD program includes two scientific areas: Nursing Sciences and Midwifery Sciences.

Within the Nursing Science domain, research areas include:

- the study of the determinants of self-care in the general adult population;
- self-care in chronic diseases (e.g., cardiovascular diseases and diabetes);
- symptom perception and interoceptive abilities;
- medication adherence and de-prescription;
- nursing in intensive care, in the elderly and in the paediatrics;
- personalized models of nursing care in disabilities;
- mutuality between nurses and patients/caregivers;
- pelvic floor issues related to urologic surgery;
- nursing management and education.

Within the Midwifery Sciences domain, research focuses on:

- the natural birth experience;
- the quality of birth services;
- issues related to stillbirth;
- HPV prevention;
- midwifery education.

Throughout the PhD program, the students will attend traditional lectures, seminars, laboratories; engage in research activities at both a national and international level, and experiment the conceptualization, design and conduction of research project relevant to the Nursing and Midwifery areas.

Career opportunities

The program prepares students for positions in the following areas: university, research centres and institutions (e.g., IRCCS, Health Ministry, National Institute of Health, National Agency of Healthcare Services, WHO, UNICEF, International Council of Nurses, International Council of Midwives, European Federation of Nurses, European Forum of National Nursing and Midwifery Associations), Healthcare regional and national services (e.g., hospitals, community services), R&D, Epidemiological services, Risk Management, CROs, Pharma.

Learn more

Public Health Epidemiology, Statistics And Economics

Medicine and Surgery

PhD students gain advanced scientific methods for public health governance and management. The program aims to develop skills for contributing to research methodology across all public health management areas.

Objectives include:

- *a solid foundation in cross-disciplinary subjects like epidemiology, statistics, outcomes research, health economics, and econometrics;*
- *the ability to apply theory to evaluate public health systems and services.*

The educational plan includes:

- *advanced knowledge in the student's research area;*
- *skills to update, deepen, and communicate research;*
- *use of appropriate tools for producing scientific evidence;*
- *designing and developing research projects;*
- *practical application and monitoring of research.*

Mission and topics covered

The program aims to train highly qualified professionals through a multidisciplinary approach, enabling them to contribute to methodological and applied research in public health governance and management. It builds a foundation in critical thinking, managing public health evidence, and understanding its multiple dimensions.

- **Epidemiology** focuses on naturalistic observational studies, large clinical and administrative databases, and real-world evidence approaches targeting risk factors and diseases.

- **Biostatistics** involves statistical methods for the design, management, analysis, and interpretation of clinical research and health surveillance studies.

- **Economic Evaluation of Healthcare Programs** compares costs and effectiveness using decision analysis and modeling methods like Markov models and microsimulation, along with outcomes research.

- **Health Technology Assessment (HTA)** is a multidimensional, multidisciplinary approach supporting decision-makers by extracting information from scientific literature and planning, organizing, and managing healthcare services.

- **Statistical Methods for Health Services and Systems** develop statistical models using large datasets to improve health system management and evaluate healthcare delivery.

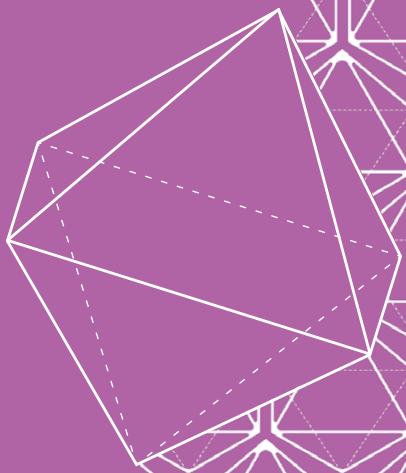
- **Health Economics and Econometrics** analyze healthcare financing from public and private views, compare health policies, allocate resources, and assess health policy impacts.

Career opportunities

During the PhD, students develop scientific expertise and a systemic understanding of public health management, preparing them for careers in:

- universities and academic institutions;
- public and private research organizations;
- international and national public health and regulatory bodies (e.g., WHO, OECD, EMA);
- regional and national health service structures (e.g., local health authorities, hospital trusts);
- departments of epidemiology, biostatistics and HTA in research institutes and hospitals;
- biomedical industries (pharmaceuticals, vaccines, medicaldevices);
- insurance companies.

Learn more



Psychology

Psychology, Linguistics and Cognitive Neuroscience

The PhD programme in Psychology, Linguistics, and Cognitive Neuroscience, based at the Department of Psychology, aims to train highly qualified researchers for high-impact, high-quality research in academia and a wide range of professional domains. It combines advanced training activities on emerging disciplinary topics, with research in multiple interdisciplinary areas. Emphasis is placed on the development of transferable skills, essential for professional growth within and beyond academia.

The programme offers two curricula:

- **Mind, Brain and Behaviour;**
- **Social, Cognitive and Clinical Psychology.**

Mission and topics covered

Both the curricula of the PhD programme in Psychology, Linguistics, and Cognitive Neuroscience prepare researchers with advanced expertise to conduct cutting-edge studies and apply their knowledge across academic, clinical, social, and technological domains.

- **The Mind, Brain and Behaviour curriculum** focuses on topics as psychological measurement, cognitive neuroscience, and neuropsychology, perception, attention, emotions, cognitive processes and language across the entire lifespan.

- **The Social, Cognitive and Clinical Psychology curriculum** encompasses topics related to clinical, social, and organizational psychology, including thinking and reasoning, motivation, personality and its disorders.

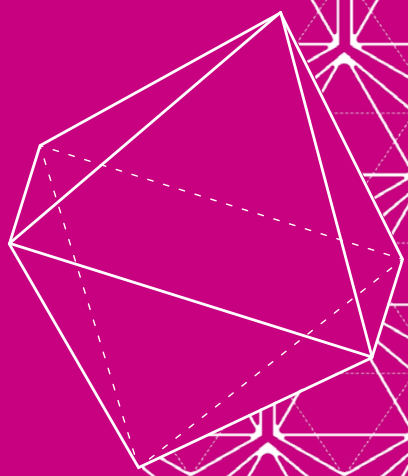
The programme provides training on emerging topics such as human–machine interaction, new technologies, and digital transformation. Graduates are equipped to address the scientific, societal, and psychological challenges arising from the evolving relationship between humans and technology. This vision fosters PhD graduates with broad, adaptable, and interdisciplinary knowledge, capable of leading innovation and responding to contemporary challenges while integrating scientific excellence with societal impact to promote well-being, safety, sustainability, and social inclusion.

Career opportunities

Graduates are equipped to apply their advanced theoretical and methodological expertise in academia and across diverse professional fields as education, healthcare, rehabilitation, social cooperation, and economic and organizational contexts. Their skills can contribute to effective communication management, data analysis, and decision-making.

Graduates are qualified to operate in innovative, high-technology sectors—such as VR/AR, digital applications, AI—where the integration of human, social, and technological factors is key to promoting well-being, social inclusion, and sustainable development.

Learn more



Educational Sciences

Cultural and Social Anthropology

The doctoral programme in Cultural and Social Anthropology (DACS) fosters advanced research in historical anthropology, politics, religion, gender, health, art, migration, as well as issues related to labour, the environment, and resources. The programme is committed to long-term fieldwork and welcomes proposals across all fields of cultural and social anthropology, with a specific focus on research that casts light on the transformations of Latin American, South-East Asian, Middle Eastern, African, and Eastern Asian, European communities and societies.

Mission and topics covered

The programme cultivates students' collaborative skills and provides the opportunity to join our ongoing research projects at both the national and international level. We encourage students to follow research themes across disciplinary fields and interrogate ethnography in the light of current issues of broader concern, such as: citizenship, the economy, the environment, gender, labour, migration, politics, health, and education.

In addition to anthropologists, the faculty includes specialists in history, philosophy, geography, literary studies, and pedagogy to foster a truly interdisciplinary environment. The anthropologists participating in the programme specialize in diverse regions of the world (Europe, the Middle East, Africa, Asia, South America, and Oceania). Their interests cover epistemology, politics, history, economy, gender, kinship, heritage, art, labour, and dispossession. To ensure a global perspective, several members of the doctoral committee are based abroad.

Career opportunities

The adaptability and intellectual flexibility that our PhDs acquire during their training as social and cultural anthropologists are strategic assets in a variety of professional settings, beyond academic research.

Core competencies gained through the programme include knowledge of local languages and cultural traditions, a micro-analytical focus able to uncover the dynamics of change underway in specific settings, and the ability to interpret cultural and social situations through a bottom-up approach that privileges the perspective of the actors involved. These skills enable our students to meet the challenges of an increasingly international economy, transnationally linked communities, and multicultural citizenry.

Our alumni operate in sectors such as human rights, migration, development, and environmental sustainability, as well as in institutions, associations, and organizations working in heritage, cultural promotion, and multicultural education. Their aptitude for critical analysis and cross-cultural understanding can be effectively applied in both public service and the private sector.

Learn more

Education in the Contemporary Society

The PhD programme, Education in the Contemporary Society, promotes theoretically informed and methodologically rigorous research on issues related to education and learning, thanks to a multidisciplinary board that includes experts in pedagogical, psychological, and philosophical issues pertaining to education. It prepares PhD students to use a variety of qualitative and quantitative research methods, taking advantage of the richness of cultural perspectives, scientific backgrounds and methodological approaches that characterise the Board. This richness of methods and approaches equips PhD students with skills appreciated in various educational environments.

Mission and topics covered

The PhD programme promotes empirical, experimental, theoretical, transformative, historical and comparative research focused on issues related to education and learning at various ages and in different contexts: schools, health systems, informal and non-formal learning contexts, social intervention contexts.

The PhD programme covers a wide range of educational issues, mainly concerning:

- the role of new technologies and media in education;
- didactic and teaching methodologies in various learning environments;
- the education-related complexities arising in contemporary societies and likely work and professional scenarios;
- the challenges posed by multiculturalism, radicalisation and fundamentalism;
- the educational implications of social exclusion and inequalities;
- cultural discrimination and injustice;
- methods for sustaining lifelong learning and continuing education;
- promotion of well-being and a high quality of life;
- methods for training in health and care;
- communication;
- family education;
- gender;
- social understanding;
- migration processes and intercultural education.

Career opportunities

The PhD programme develops professional profiles with expertise in

- the design, evaluation, and supervision of educational processes in general;
- the orientation and job training in public and private companies, in public administration and in social services and enterprises implementing innovative projects at a national and international level;
- the coordination of socio-educational services and projects, on behalf of public and private educational, professional development, and research institutions;
- the design of training and educational proposals for cultural and artistic organisations, services and enterprises to enhance the cultural heritage;
- the design of educational, professional development, and teaching/learning programmes in education services and schools for children, adolescents, adults, and elders;
- the design of online environments and digital learning programmes;
- the design of indoor and outdoor environments for the implementations of training and educational processes;
- the design of serious games, interactive virtual simulations, and technological applications for communications, training, and learning.

Learn more

Mathematical Physical and Natural Sciences

Physics and Astronomy

Area of Mathematical, Physical and Natural Sciences

PhD Laureates in Physics and Astronomy are professionals ready to pursue a career at the cutting-edge of fundamental and applied research, with expertise in theoretical, experimental and applied Physics.

Their training is developed in collaboration with major national research institutes (INFN, CNR, INAF, ENEA), international laboratories (CERN, JET, ESO, ...), foreign universities, and national and international companies (ENI, Infineon Technologies, ST-Microelectronics, Thales Alenia Space, Melexix, ...).

Mission and topics covered

The PhD programme trains students to independently design and carry out innovative research in theoretical, experimental, and applied Physics. They will develop their knowledge and skills through original, cutting-edge research activities in the following fields:

- **Theoretical physics:** string and quantum field theory, field theories of the standard model, lattice field theories and computational physics.
- **Subnuclear physics:** detector design and operation, and data analysis in at the large hadron collider, neutrino physics, astroparticles and fundamental physics in space.
- **Astrophysics:** cosmology and primordial universe, galaxy studies, high energy astrophysics, gravitational waves and their sources.
- **Plasma physics and biophysics:** magnetically confined, thermonuclear and laser-produced plasmas, industrial plasmas applications. Structure and dynamics of biomolecules; non-linear optical microscopy for biosystems, models for dynamic processes, nanoparticles for nanomedicine, aberrations correction.
- **Applied physics and electronics:** design and characterization of analog or mixed integrated circuits (research projects and industry). Digital systems based on microcontrollers, fpga and integrated circuits.
- **Quantum-based computing and sensing devices, and quantum machine learning.**

Career opportunities

PhD graduates will be able to devise and manage a research project with a global attitude to problem-solving, modeling and implementation. Career opportunities include academia, public and private research institutes and industry, particularly in R&D divisions, marketing, High-Tech and Information and Communication Technology.

Other opportunities lie in the advanced tertiary sector in the development of quantitative models for the analysis of complex systems, for data analysis and for big-data, as well as in the economic-financial, bio-medical and environmental fields.

Learn more

Computer Science

Area of Mathematical,
Physical and Natural Sciences

The PhD program in computer science is provided by the Department of Informatics, Systems, and Communication. It prepares highly-qualified researchers for conducting high-impact and high-quality research in academia, and for designing and developing complex innovative solutions in industry.

Our program combines training activities, in the form of coursework, on both fundamental and emerging topics in computer science, with research activities in multiple and interdisciplinary areas of computer science.

Mission and topics covered

The PhD program in computer science covers a variety of topics, specifically:

- **Foundations of Computer Science** focuses on the study of theoretical and foundational aspects of computation, modeling and simulation of complex systems, and the development of innovative algorithmic methodologies.
- **Computational Life Science and Bioinformatics** consider various algorithmic and computational aspects of genomics, transcriptomics and phylogenetics in Bioinformatics, simulation and modeling of processes in computational biology, and, systems biology
- **Software Engineering and Architecture** deal with topics related to the development of software systems, in particular the design, quality control, maintenance, and evolution of software systems.
- **Web and Information Systems** aims to develop models and techniques to support the processes of management and analysis of a wide range of data.
- **Intelligent Sensing, including Robotics, Real-time Systems, Graphics and Computer Vision,** focuses on robotics, real-time intelligent sensing, and various aspects of the analysis and management of multimedia and sensorial data.
- **Artificial Intelligence and Decision Systems** involve the study of research topics traditionally linked to Artificial Intelligence, along with methods, techniques, models, and applications for decision support.

Career opportunities

The job market is rapidly changing, particularly because of the influence of AI, with a growing demand for highly-qualified professionals who are able to perform research, promote innovation, and develop complex IT systems. Our PhD program focuses on training experts who couple an advanced knowledge of state-of-the-art solutions with the ability to master and improve them. Our students are prepared to enter the national and international markets in all fields of computer science: bioinformatics, software engineering, data science, robotics, artificial intelligence, machine learning, and cybersecurity.

This trend is also confirmed by the number of PhD positions created in collaboration with companies willing to define ad hoc training and research paths leading to future recruitment.

Learn more

Mathematics

Course in agreement with the University of Pavia

Area of Mathematical,
Physical and Natural Sciences

The programme involves the Universities of Milano-Bicocca (MIB), Pavia (PV) and Cattolica del Sacro Cuore (CBS), along with the Istituto Nazionale di Alta Matematica (INdAM), and is based at the Department of Pure and Applied Mathematics, University of Milano-Bicocca, and the "F. Casorati" Department of Mathematics, University of Pavia.

It is divided between 5 curricula:

1. *Algebra and Geometry;*
2. *Mathematical Analysis;*
3. *Numerical Analysis and Mathematical Modelling;*
4. *Mathematical Physics;*
5. *Probability, Statistics and Mathematical Finance.*

Mission and topics covered

The Joint PhD Program in Mathematics promotes research in the following areas:

- Group theory, Lie algebras (MIB,CBS); category theory, algebraic geometry (PV), differential geometry (MIB, PV, CBS), symplectic (MIB, CBS) and hyperbolic (PV) geometry.
- Partial differential equations and their applications; control and optimisation theory, nonlinear and functional analysis (MIB, PV, CBS); harmonic and geometric analysis (MIB); variational techniques, calculus of variations (PV).
- Study of numerical methods for PDEs with focus on applications; constrained optimization models and methods; computer aided design, approximations of data and functions, numerical linear algebra (MIB, PV, CBS).
- Soft matter mathematical modelling, kinetic theory, classical and quantum field theory, complex systems (PV); fluid mechanics (PV e MIB), integrable systems, Frobenius manifolds, dynamical systems, quantum mechanics (MIB); variational problems for beams, membranes and liquid crystals (CBS); continuum mechanics models for nonlinear elastic materials and non-Newtonian fluids (CBS).
- Bayesian statistics, quantum probability, probability measures (PV); statistical mechanics (MIB and PV); random walks, systems, stochastic equations and control, economic and financial applications (MIB).

Career opportunities

In addition to academia and public and private research centers, students will find professional opportunities:

- in banks and insurance companies;
- companies performing actuarial activities;
- private companies, performing modelling, data analysis;
- consulting and IT companies;
- statistical and financial consultalting as freelancers;
- teaching, mostly in high schools.

Learn more

Marine Sciences, Technology and Management (MTM)

Area of Mathematical, Physical and Natural Sciences

The PhD in Marine Sciences, Technology and Management is a consortium program of the University of Milano-Bicocca and the Italian Institute of Technology, a leading national center for advanced research and innovation. The program offers an interdisciplinary, research-driven path integrating marine science, cutting-edge technologies, and management skills with training opportunities in the Milan's Department of Earth and Environmental Sciences, the School of Law, the IIT labs in Genoa, and the MaRHE Center in the Indian Ocean (Maldives).

Mission and topics covered

The program's mission is to train researchers able to understand, innovate, and manage the marine system from ecological, technological, legal, and geopolitic perspectives. Its multidisciplinary curriculum spans the full spectrum of marine knowledge.

In **marine sciences,** candidates explore coral restoration, ecology and conservation of marine species, deep-sea functioning, and ocean processes. In **humanities,** the course addresses ocean affairs and the law of the sea, polar law, the governance of the ocean space, the resolution of maritime disputes, cultural geography, and environmental conflicts shaping global ocean policy.

The technology dimension focuses on blue technologies, new materials, advanced sensing and analytical technologies, use of aerial drones and underwater methodologies for monitoring and restoring marine environments. Research aims at acquiring practical skills across the full workflow, from field and lab acquisition procedures to advanced data processing and analysis. The management dimension develops competencies in the ecosystem-based management of the sea, the psychological and social drivers of environmental awareness, teamwork in the field, and group dynamics, including in extreme environments.

Doctoral researchers gain hands-on experience in state-of-the-art laboratories at Milano-Bicocca, IIT, the MaRHE Center in the Maldives, and the numerous world's public and private entities with which the program has signed exchange agreements.

Career opportunities

Graduates are uniquely prepared for advanced research, innovation, and leadership roles, including as academic and research scientists, marine policy and law specialists, private industry consultants, marine technology developers, Blue-economy project managers, restoration practitioners, intergovernmental organization or NGO officers.

Career opportunities also span across innovative sectors such as those related to ocean renewable energy, blue bioeconomy, biotechnology, environmental impact assessment specialists, environmental certification, monitoring and management of remote marine protected areas, independent experts in judicial and arbitral proceedings, and STEM education.

Learn more

Materials Science and Nanotechnology

Area of Mathematical, Physical and Natural Sciences

The PhD Program in Materials Science and Nanotechnology, coordinated by the Materials Science Department, aims to prepare students for both experimental and theoretical research—whether fundamental, applied, or industrial—in the subfields of Physics and Chemistry that form the foundation of Materials Science and its technological applications. Key high-tech industries (such as Pirelli, Micron, STMicroelectronics, ENI, RSE, etc.) are often directly involved, offering PhD scholarships to support our students.

Mission and topics covered

The program offers students the opportunity to conduct research in several fields, including the design, synthesis, growth, functional characterization, and computer simulation of materials for a wide range of applications. The main classes of materials investigated include:

- organic, polymeric, and inorganic semiconductors (thin films, quantum dots, nanostructured materials) for photovoltaics, photocatalysis, smart windows, optoelectronics, thermoelectrics, photonics, sensors and imaging;
- inorganic semiconductors and dielectrics for microelectronics (memories and logic), spintronics and neuroelectronics;
- nanostructured oxides for sensors, photocatalysis, and transportation applications (nanostructured fillers);
- glass-based materials for sensors, imaging and lighting;
- composite materials for electrochemical energy storage and conversion;
- polymeric or hybrid porous materials for gas storage and separation;
- molecular and polymeric organic materials for drug delivery;
- quantum materials and 2D materials.

International collaborations provide students with a broad range of opportunities for research stays abroad.

Career opportunities

Materials Science and Nanotechnology lie at the very center of technological innovation, attracting major investments not only from universities but also from governments and private industries. Given this context—and the fact that the program trains young researchers with state-of-the-art technical and scientific skills in a fully international environment—it is no surprise that our graduates find employment in high-technology companies both within the Lombardy region and internationally.

Learn more

Chemical, Geological and Environmental Sciences

Area of Mathematical, Physical and Natural Sciences

The PhD programme is full-time and is arranged in three curricula leading to a doctoral degree in Chemistry, Geology and Environmental Sciences. The programme provides outstanding students with an opportunity to pursue in-depth and rigorous research projects, exploring a wide range of issues including climate change and planet Earth, sustainability, energy, water, resource use, land use, environmental issues and conservation. This unique framework of scientific disciplines is made possible thanks to the laboratory facilities available at the Departments of Earth and Environmental Sciences (DISAT), Biotechnologies and Biosciences (BtBs) and Materials Science.

Mission and topics covered

The PhD programme is multidisciplinary and transdisciplinary, offering interactions among scholars with different cultural backgrounds while maintaining a high level of specialisation in the specific research topics.

- **Chemical Sciences.** Professionals are trained in the following areas:

  - Chemistry applied to the prevention and solution of environmental problems;
  - Chemistry applied to the development of materials;
  - Chemistry of bioactive compounds

- **Geological Sciences.** Professionals are trained who are able to promote cultural growth and research in the field of geosciences and geosciences applied to the protection of the environment and its resources. In particular, skills will be developed on the dynamics of the Earth, climate change and the environmental and geological risks that also derive from human activities

- **Environmental Sciences.** This develops the ability to operate in multidisciplinary and sustainable research activities, along three main lines:

  - knowledge of the terrestrial and marine environment;
  - assessment and prevention of risks, for humans and the environment, deriving from human activities;
  - development of innovative methodologies and technologies for the rehabilitation, conservation of the environment and for the protection of biodiversity.

Career opportunities

Professionals specialising in the scientific fields of the PhD programme are in high demand as more and more focus is placed on the direct and indirect effects of climate change on our planet. PhDs in Chemical, Geological and Environmental Sciences will be able to promote the advancement of scientific and technological knowledge both in the academic and extra-academic fields, build synergies with the industrial ecosystem and develop effective proposals for sustainable development.

The combination of multidisciplinary and specific skills, and the versatility acquired during the doctoral path will allow the carrying out of research activities in universities or in public and private research centers in the various areas that fall within the disciplines of Chemical, Geological and Environmental Sciences.

Learn more

Converging Technologies for Biomolecular Systems (TeCSBI)

Area of Mathematical, Physical and Natural Sciences

The PhD Programme in Converging Technologies for Biomolecular Systems (TeCSBi) promotes multidisciplinary research in Life Science, specifically for investigating biological systems: understanding their properties, interacting with them or exploiting them for ecosystem conservation, therapeutic or industrial purposes. Complementary expertise of the Members of the PhD program Board in the biological, chemical and computational areas guarantees a multidisciplinary and transdisciplinary training and ensure the functional and fruitful connection between the different study areas and technologies essential for developing innovative and transferable research. The projects addressed by PhD students concern fundamental and applied research. Solid partnerships with industrial and territory stakeholders will favour the technological transfer of the developed process and product innovation, as well as improving job placement strategies.

Mission and topics covered

The educational goal is to train PhD students to become professional figures who have acquired the so-called T-skills, where specific and deep knowledge (vertical skill) is combined with an open vision and wide expertise (horizontal skills), resulting in the ability to become active members of multidisciplinary teams. Accordingly, students will be trained not only to master specific scientific knowledge, but also skills related to entrepreneurship and public engagement.

Research projects focus on three main pillars:

- study of complex biological functions with molecular and Systems Biology approaches;
- Synthetic Biology, Bio-organic Chemistry and Green Chemistry;
- characterization of biodiversity and bioprospecting for the protection and valorization of ecosystems and resources.

TeCSBi adopts an Interdisciplinary and Transdisciplinary approach.

This will be pursued in research and training in order to meet the challenge of understanding, controlling and exploiting complex biological systems with the required biological, chemical and computational expertise.

The PhD course has established and will promote further interactions with industrial and territory planning partners in order to provide the intersectoral training required to acquire an entrepreneurial and management mindset.

Career opportunities

The main areas of interest for the professional profiles developed during the TeCSBi programme are:

- Design, Screening, and Production of molecules of interest to the chemical, pharma and agro-food industries (proteins, metabolites, fine and bulk chemicals, nutraceuticals, nano-particles and nano-derivatives).
- Development and optimisation of sustainable bio-based processes, including technology transfer.
- Management of biological (bioprospecting) and natural resources, both in private and public sectors, also in the context of ecological restoration and sustainability policy.
- Molecular and physiological diagnostics, gene therapy, advanced (bio)materials.

Learn more

Sociology

Analysis of Social and Economic Processes (ASEP)

ASEP offers students cutting-edge academic and applied training in social science. By the end of the program, graduates will have developed the knowledge and methodological skills needed to design and conduct conceptually grounded and empirically rigorous research on social and socioeconomic phenomena—both within and beyond academia.

The program spans three years. Year 1 focuses on coursework, the qualifying paper, and the dissertation prospectus. Years 2 and 3 are fully dedicated to conducting research and writing the doctoral dissertation.

Mission and topics covered

ASEP's mission is to provide highly motivated students with an outstanding training and research experience in the social sciences.

The program is coordinated by an international Steering Committee that brings together diverse disciplinary backgrounds, research interests, theoretical perspectives, and methodological approaches. This diversity ensures a rich and stimulating academic environment, offering students a wide range of opportunities to pursue their intellectual and professional goals.

Reflecting its international orientation, ASEP conducts all activities in English and welcomes students from all countries. As part of their training, students are required to spend a minimum of 6 up to 12 months abroad, further enriching their research experience and fostering international collaboration.

ASEP places a special emphasis on the study of inequalities, in their multiple dimensions: social, economic, generational, gender, territorial, digital, and educational.

Research topics include, but are not limited to:

- Social change and welfare state;
- Subjective well-being and youth condition;
- Life courses, family, and gender relations;
- Education and labour markets;
- Organizations, migration processes and social networks;
- Socio-economic development and evaluation of public policies;
- Designs and methods of social research;
- Culture and cultural change.

Career opportunities

Graduates of ASEP are equipped to pursue successful careers both in academia and in non-academic settings.

Beyond university research and teaching, ASEP PhDs find employment in market research (e.g. Doxa, Ipsos,...), public institutions (e.g. European Commission, Regions, Municipalities, Utilities...), international organizations (e.g. Oecd, World Bank, Unesco, Think Tanks, ...), and private sector research departments (ex. Foundations, Banks, Companies) where advanced analytical and methodological expertise is increasingly in demand.

Learn more

URBEUR – Urban Studies

Sociology

URBEUR is an international PhD programme that offers scholars, researchers, and professionals an interdisciplinary training in Urban Studies, combining a solid theoretical foundation with advanced methodological tools for both qualitative and quantitative research.

Originated more than 20 years ago, as a cultural project centred on the comparative study of European cities, the URBEUR PhD programme has been part of a vibrant international academic network, building long-term collaborations with leading European and global universities and research centres.

Mission and topics covered

URBEUR places strong emphasis on comparative perspectives and the development of interdisciplinary competencies, enabling candidates to critically engage with the complex transformations of contemporary cities. It provides candidates with the theoretical and methodological tools needed to analyse urban phenomena and transformations.

Intensive courses and seminars offer an interdisciplinary and in-depth understanding of the urban field, focusing on a wide range of issues and topics, including:

- new theoretical and research directions;
- transformations of local and national welfare systems;
- globalization processes and their impact on cities;
- social inequalities;
- urban segregation;
- urban policies;
- the impact of new technologies;
- social innovation;
- urban networks;
- environmental issues;
- social housing;
- urban mobility;
- urban cultures and diversities;
- territorial development and urban governance.

From a methodological perspective, the Programme offers advanced training in both quantitative and qualitative research methods, providing the skills required to conduct comparative territorial studies. Courses cover research design, spatial methods and GIS for the social sciences, as well as visual and ethnographic methods.

Career opportunities

URBEUR trains high-level researchers and professionals for careers in academia, international and national institutions, research and training centres, cultural organizations, and public agencies. Over its history, a large number of international collaborations have been formalized supporting joint supervision, exchange programmes, and visiting opportunities that allow PhD candidates to share ideas, methods, and experiences within an international research community. Over 50% of our PhD graduates hold academic positions in Italy or abroad, confirming URBEUR's strong reputation and international reach.

Learn more

Multidisciplinary industrial PhD

Strategic Innovation for Sustainable and Smart Ecosystems (SIS2E)

Multidisciplinary Industrial PhD

Activated in partnership with some international and national companies and institutions, the Industrial Doctorate SIS2E aims to the formation of researchers able to bridge science and society.

The program focuses on two key dimensions:

1. *the balance between basic science and technological valorization and dissemination;*
2. *the integration of cross-disciplinary and specialized expertise.*

SIS2E offers an international, cross-disciplinary research environment that promotes scientific dissemination and societal engagement. Doctoral candidates collaborate with business and institutional partners, applying their research to real-world challenges and contributing to public debate.

Mission and topics covered

Combining academic rigor with practical impact, the program aligns its research with the UN Sustainable Development Goals and the mission of the University of Milano-Bicocca.

The educational program begins with common foundation courses (first year) on Research Methods, Innovation, Technology Transfer and IP management, and develops into more specialized courses (2nd and 3rd year) belonging to the following 4 tracks:

1. **Process innovation**
2. **Product innovation**
3. **Society & Organizations**
4. **Health and wellness**

SIS2E blends methodological rigor with innovation-oriented themes to ensure the relevance and applicability of research outcomes. The program enhances abilities in:

- managing complex and sustainable innovation projects;
- balancing exploration and implementation (ambidexterity);
- understanding the interplay between science, technology, society and business;
- leading collaborations across interconnected ecosystems, communities and networks.

Career opportunities

Graduates of SIS2E acquire innovation-oriented profiles highly valued by companies, research centers, and public institutions at both national and international levels.

Typical professional roles include:

- data scientists, analysts, and AI experts;
- researchers and research leaders in all disciplines;
- product developers and R&D managers;
- founders of start-ups and scale-up strategists;
- investment analysts in venture capital for cutting-edge technologies;
- managers of social innovation and welfare transformation projects.

Learn more

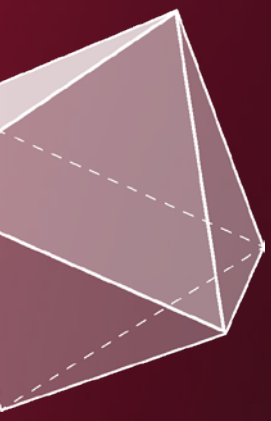
Admissions

To be admitted, all candidates must:

- hold a Master's degree (or an equivalent foreign qualification) in a field specified by the specific programme chosen in the call for applications;
- pass the admission test as defined in the call for applications of each programme;
- be proficient in English (for non-Italian speakers): this only applies to some programmes, and it is specified in the call.

Call for applications: opens annually in Spring.

Click here for previous Calls and important details.



Scholarship

- Gross annual amount € 16.243,00
- annual research budget: 10% of scholarship
- the scholarship increased by 50% for research periods abroad

PhD in a nutshell

- Duration: 3 years for all Programmes (and 4 years for ECOSTATDATA)
- Course-specific training activities
- Interdisciplinary courses
- Research periods abroad / at partner institutions
- Additional opportunities: jointly supervised theses (cotutelle), teaching contracts, assistant contracts, involvement in research projects

Contact us

Reception upon appointment to be requested at dottorati@unimib.it

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