



BIOENGINEERING

PHD PROGRAMS



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Programme

The Doctoral (PhD) Programme in Bioengineering trains graduate students through a strong interdisciplinary education in engineering methodologies and technologies to develop research on biological systems and health sciences. Methods, devices, and systems are developed with a strong multidisciplinary approach, considering from the molecular and the cellular levels to complex living organisms, with the purposes of improving diagnosis and therapy as well as health and daily life structures and services. From 2013, the PhD Program in Bioengineering took an inter-department structure. Faculty members of the PhD Advisory Board belong to two Departments of Politecnico di Milano: DEIB (Department of Electronics, Information and Bioengineering) and CMIC (Department of Chemistry, Materials and Chemical Engineering “G. Natta”). Students develop their PhD research programs in the most advanced topics currently ongoing at DEIB and CMIC. Stage periods in distinguished national and international research institutes are also an essential feature of the student training.

Mission and goals

The Bioengineering PhD Programme at Politecnico di Milano provides graduate students with strong interdisciplinary theoretical and experimental education on engineering, mathematics, medical and biological sciences, aiming at developing high-level engineering problem-solving abilities in life science, in research or in private/public industrial contexts.

At the end of the program, PhD candidates are expected to possess all the required capabilities to provide significant contributions to innovative projects in biomedical engineering, to propose new methodological and technical solutions, to assess potentials of new technologies in clinics and healthcare systems, as well as to control services, processes and devices manufacturing in the biomedical field.

The Bioengineering PhD Programme enrolls, every year, an average of 20 students. After admission, each PhD student chooses a research 'Advisor' and is assigned to a Faculty member of the PhD Board ('Tutor'). Courses, lectures, thematic seminars, project workshops and experimental activities are organized and offered yearly to the students, as a way to create a common educational framework and provide multiple options for deepening specialized research topics relevant to the PhD thesis development.

The PhD Programme aims at training people with high-level scientific profiles who intend to practice their major activities in the field of Bioengineering. The PhD Programme in Bioengineering addresses theoretical and experimental activities in four major research areas: Biomimetic Engineering and Micro-Nano Technologies, Rehabilitation Engineering and Technology, Technologies for Therapy, Physiological Modelling and non-Invasive Diagnostics.

More specific areas include but are not limited to: molecular and cellular engineering, biomaterials, tissue engineering, bio-artificial interfaces and devices, neuro-prostheses, movement analysis, cardiovascular and respiratory system bioengineering, central nervous system signal and image processing for rehabilitation, biomechanics, computational fluid-dynamics, computer assisted surgery and radiotherapy, artificial organs, implantable devices, biomedical signal and image processing, e-health, bioinformatics and functional genomics.

Research focuses on theoretical models, methods, and technologies to support design of applications, software and hardware systems, together with tools and prototype devices. The involvement of industrial and clinical partners reinforces the mix between theory and application, which is the strength of the PhD Programme.

Career Opportunities

Although academia, namely university research and higher education teaching, has been considered the natural destination for PhD graduates for years, opportunities to work in non-academic jobs seem to be increasing. More and more PhD graduates in Bioengineering work either in clinical research centers or in the science industry. In recent years there has been a trend for companies to become more research oriented, which in turn has opened up new jobs. The majority of PhD graduates who work outside of higher education are employed in areas where they can make use of their specialised knowledge and skills. The creation of spin-off and start-up companies is also an increasing trend for PhD graduates.

Eligible students

Master degree curricula are eligible for PhD positions. Applicants can be admitted to the Doctorate without any limits of age or citizenship. Admission is selective, subject to skills and inclination toward research.

Scholarships

Over the three-year duration of their studies, PhD candidates are supported by scholarships granted from the Research Ministry, the Politecnico di Milano, the DEIB and CMIC departments (specific research project funds), other public or private Institutions, or companies. The number of available scholarships may change from year to year, typically 10-12 per year.

Contacts

For further information on specific aspects of the course and curricula, please visit <https://www.phdbioengineering.polimi.it/> or contact the School of Doctoral Programmes – Politecnico di Milano at <https://www.dottorato.polimi.it/en>.

