



PhD in BIOINGEGNERIA / BIOENGINEERING - 38th cycle

Number of scholarship offered	8
Department	DIPARTIMENTO DI ELETTRONICA, INFORMAZIONE E BIOINGEGNERIA

Description of the PhD Programme
<p>The PhD Programme aims at developing scientific profiles who intend to practice their major activities in the field of Bioengineering. It addresses theoretical and experimental activities in 4 major research areas: Biomimetic Engineering and Micro-nano Technologies, Rehabilitation Engineering and Technology, Technologies for Therapy, and 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, functional genomics and molecular medicine. Research focuses both on theoretical models, methods and technologies to support design of applications, software and hardware systems, together with tools and prototype device development. The involvement of industrial and clinical partners reinforces the mix between theory and application which is the strength of this PhD. Stage periods in distinguished research institutes in Italy and abroad are an essential feature of the PhD candidate training. Scientific and research activities of PhD Bioengineering candidates are strongly grounded on research laboratories located inside and outside the Departments in cooperation with other research institutions and university hospitals. Publications in scientific peer-reviewed journals, participation to international projects and the numerous collaborations confirm the excellence level of the activities carried out in this PhD programme.</p>



PhD in BIOINGEGNERIA / BIOENGINEERING - 38th cycle

INTERDISCIPLINARY Research Field: A SOCIO-TECHNICAL APPROACH TO M-HEALTH: THE CASE OF WEARABLE DEVICES

Monthly net income of PhDscholarship (max 36 months)	
€ 1250.0	
In case of a change of the welfare rates or of changes of the scholarship minimum amount from the Ministry of University and Research, during the three-year period, the amount could be modified.	
Context of the research activity	
Motivation and objectives of the research in this field	<p>Interdisciplinary PhD Grant</p> <p>The PhD research will be carried out in collaboration with research groups of the PhD programme in "INFORMATION TECHNOLOGY".</p> <p>See https://www.dottorato.polimi.it/?id=422&L=1 for further information.</p>
Methods and techniques that will be developed and used to carry out the research	<p>The research is located at the intersection of biomedical technologies and artificial intelligence techniques for the design of wearable devices for health monitoring, with particular attention to respiratory diseases. The engineering aspects will be integrated with an epistemological analysis, able to highlight the ethical, social and regulatory aspects of data collection, such as quality standards, the role of empirical evidence to use these data for predictive purposes, benefits related to personalization and health accuracy. These aspects are in turn integrated into the design of wearable devices in a sort of virtuous methodological circle whereby each of the two dimensions (engineering and ethical-social) rests on and uses the results of the other.</p>
Educational objectives	<p>The supervisors and their research groups support the research development. Laboratory activity is central in the research path. Seminars and courses encourage a strong interdisciplinary approach. The PhD candidate is encouraged to spend a period of study abroad (with</p>



	availability of an additional financial support).
Job opportunities	Job opportunities include research both in academic and private institutions in Italy and abroad, and in industry. Spin-off and startups from research results are encouraged. Employment in this field offers various interesting opportunities.
Composition of the research group	1 Full Professors 1 Associated Professors 1 Assistant Professors 6 PhD Students
Name of the research directors	PROF. ALIVERTI ANDREA

Contacts	
<p>Prof. Andrea Aliverti email: andrea.aliverti@polimi.it Ph: +39 02 2399 9006</p> <p>Prof. Viola Schiaffonati email: viola.schiaffonati@polimi.it Ph: +39 02 2399 3622</p>	

Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--

Scholarship Increase for a period abroad	
Amount monthly	625.0 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
<p>Educational activities (purchase of study books and material, funding for participation in courses, summer schools, workshops and conferences): Financial aid per PhD student 5.095,96 Teaching assistantship: availability of funding in recognition of supporting teaching activities by the PhD student: there are various forms of financial aid for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations (max 40 hrs per year).</p>



Computer availability: 1st, 2nd, 3rd year: individual use
Desk availability: 1st, 2nd, 3rd year:
individual use



PhD in BIOINGEGNERIA / BIOENGINEERING - 38th cycle

OPEN SUBJECT Research Field: BIOINGEGNERIA / BIOENGINEERING

Monthly net income of PhDscholarship (max 36 months)

€ 1250.0

In case of a change of the welfare rates or of changes of the scholarship minimum amount from the Ministry of University and Research, during the three-year period, the amount could be modified.

Context of the research activity

Motivation and objectives of the research in this field

The PhD programme aims at developing scientific profiles who intend to practice their major activities in the field of Bioengineering.

It addresses theoretical and experimental activities in 4 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
- Neuroprostheses
- 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



	<ul style="list-style-type: none"> • Implantable devices • Biomedical signal and image processing • E-Health • Bioinformatics, functional genomics and molecular medicine <p>http://www.phdbioengineering. polimi.it/</p>
Methods and techniques that will be developed and used to carry out the research	<p>Research focuses on theoretical models, methods and technologies to support design of applications, software and hardware systems, together with tools and prototype device development. The involvement of industrial and clinical partners reinforces the mix between theory and application, which is the strength of this PhD programme. Stage periods in distinguished research institutes in Italy and abroad all over the world, are essential features in the PhD candidate training. Scientific and research activities of PhD candidates are strongly grounded on research laboratories located inside and outside the Departments, in cooperation with other research institutes and university hospitals.</p>
Educational objectives	<p>The supervisor and his research group support the research development. Seminars and courses encourage an interdisciplinary approach. Laboratory activity completes the research path. Students are also encouraged to spend a period of study abroad (with availability of an additional financial support).</p> <p>www.dottorato.polimi.it</p>
Job opportunities	<p>Job opportunities include research both in academic and private institutions in Italy and abroad, and in industry. Spin-off and startups from research results are encouraged. Employment in this field offers various interesting opportunities.</p>
Composition of the research group	<p>10 Full Professors 24 Associated Professors 13 Assistant Professors 7 PhD Students</p>
Name of the research directors	Any faculty member



Contacts
<p>PhD Coordinator Prof. Gabriele Dubini email: gabriele.dubini@polimi.it Ph: +39 02 2399 4254</p> <p>PhD Programme - BIO - Secretary Marco Simonini Department: DEIB email1: phd-bio@polimi.it email2: marco.simonini@polimi.it Ph: +39 02 2399 363</p>

Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--

Scholarship Increase for a period abroad	
Amount monthly	625.0 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
Increase in the scholarship for stays abroad: euro 625,00 per month, for up to 6 months