



**POLITECNICO**  
MILANO 1863

**Master**

**RehabTech:  
Technologies for innovation  
in rehabilitative medicine  
and for assistance**

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*From technological innovation, to  
clinical translation, research and  
healthcare management*

In partnership with:



CONGREGAZIONE DELLE SUORE  
INFERMIERE DELL'ADDOLORATA  
OSPEDALE VALDUCE

IRCCS ASSOCIAZIONE  
**EM** la Nostra Famiglia  
EUGENIO MEDEA



**Fondazione**  
**Don Carlo Gnocchi**  
Onlus



THE BIROBOTICS  
INSTITUTE



**Sant'Anna**  
School of Advanced Studies - Pisa

# THE REASONS FOR THIS MASTER

The **world of medicine** is characterized by a **great and important technological challenge**. The integration of technological, management and clinical expertise represents an important frontier of **higher education**.

## Current Context Limits

Currently the training of professionals who work in the global field of health and assistance in the rehabilitation and inclusion field is made in an independent way, and the interaction occurs only in the field. As a consequence, it is characterized by clear gaps:

- distance between the needs of the clinic and the design of new devices;
- difficulty of research laboratories to transfer their prototypes to the market;
- difficulties for investors to guide and support the innovation process;
- difficulties of healthcare management to manage changes related to the introduction of technologies.

## The challenge of this Master: a new community and unique training content

The proposal of this Master is to **integrate a group of professionals with different backgrounds into a classroom**. They will build a comprehensive knowledge of the challenges related to the **integration of technologies in the rehabilitation clinic and in the management of the continuity of care**. In this way, we can **speed up the impact of these technologies in the lives of patients, their families, and clinical professionals**.

The teaching will deal with the understanding of the medical bases of the neurorehabilitation path, the design of the requirements and technical specifications of technologies and robotics in rehabilitation (including robotics, artificial intelligence, neurostimulation, neuroplasticity, and virtual reality). The path will then address the study of industrial transfer processes, technological evaluation, and innovation. Clinical translation methodologies and evidence-based medicine will be addressed. The patient will be at the center of the teaching, through appropriate ethical and engagement considerations. The path will conclude with the study of organizational models integrated with the purpose of delivering innovative services.

## DIRECTORS



### **Prof. Alessandra Pedrocchi**

Associate Professor of Electronic Bioengineering, Department of Electronics Information and Bioengineering, Politecnico di Milano



### **Prof. Maria Chiara Carrozza**

Full Professor of Industrial Bioengineering, Biorobotics Institute - Sant'Anna School of Advanced Studies, Scientific Director of the Don Carlo Gnocchi Foundation - Onlus



### **Dr. Franco Molteni**

Director of the Complex Recovery and Functional Rehabilitation Unit of Valduce Hospital – Rehabilitation Center Villa Beretta

## Scientific support



National Bioengineering Group

## Sponsor

# UNIVERLECCO

This Master is supported by the **UNIVERLECCO Association**, which for over twenty years has been dedicated, thanks also to the contributions of Regione Lombardia, Fondazione Cariplo and INAIL, to the promotion, aggregation, and coordination of projects, research, and training activities of the actors of the Lecco System, with particular focus on neuro-rehabilitation.

## SCIENTIFIC COMMITTEE

**Dr. Giovanna Beretta** - Director Rehab Medicine and Neurorehabilitation, Ospedale Niguarda Ca' Granda, Milan, Local Secretary SIMFER Lombardia

**Prof. Maria Chiara Carrozza** - Full professor Industrial Bioengineering, Biorobotics Institute - Sant'Anna School of Advanced Studies Pisa, Scientific Director of the Don Carlo Gnocchi Foundation – Onlus

**Prof. Eugenio Guglielmelli** - Full professor of Industrial Bioengineering, Università Campus Biomedico, Rome

**Prof. Emanuele Lettieri** - Full Professor at Politecnico di Milano, Department of Management, Economics & Industrial Engineering

**Prof. Stefano Masiero** - Full Professor of Physical and Rehabilitation Medicine, University of Padua, Director of the Orthopaedic Rehabilitation Complex Operating Unit of the University Hospital of Padua.

**Dr. Franco Molteni** - Director of the Complex Recovery and Functional Rehabilitation Unit of Valduce Hospital – Rehabilitation Center Villa Beretta

**Prof. Alessandra Pedrocchi** - Associate Professor of Electronic Bioengineering, Department of Electronics Information and Bioengineering, Politecnico di Milano

**Dr. Stefano Respizzi** - Director of Rehabilitation and Functional Recovery Department, ICH Humanitas Research Hospital

**Dr. Marco Sala** - Director of the School of Higher Education IRCCS Institute E. Medea

**Prof. Luigi Tesio** - Full Professor of Physical and Rehabilitative Medicine, University of Milan, Director of the Department of Neuro-Rehabilitative Sciences and Neuromotor Rehabilitation Research Laboratory, IRCCS Istituto Auxologico Italiano, Milan

## INTERNATIONAL INSTITUTIONS PROFESSORS

**Dr. Deborah Backus, PT, PhD, FACRM** - Director of Multiple Sclerosis Research, Shepherd Center, USA, Past President American Congress of Rehabilitation Medicine (ACRM)

**Prof. Claudia Gandini Wheeler-Kingshott** - Full Professor in Magnetic Resonance Physics Neuroinflammation, University College of London, Queen Square Institute of Neurology - Faculty of Brain Sciences

**Prof. Friedhelm Hummel** - Full Professor of Clinical Neuroengineering Brain Mind Institute, Center of Neuroprosthetics, Swiss Federal Institute of Technology EPFL, Swiss

**Prof. Dr. Robert Riener** - Full Professor for Sensory-Motor Systems at the Department of Health Sciences and Technology, ETH Zurich, Director SMS Lab, University of Zurich, Swiss - Vicepresident of International Congress of Rehabilitation Robotics (ICORR)

**Prof. Andrea Serino** - Professor at Swiss National Science Foundation, University Hospital of Lausanne, Director of MySpace Lab, Swiss

## TARGET STUDENTS

The Master is addressed to people with Bachelor Degree or Master of Science in:

- **Engineering**
- **Medicine and Surgery**
- **Psychology or neuropsychology**
- **Rehabilitation Technology** (Physiotherapists, Occupational therapists, Speech therapists, Nurses, etc.)
- **Health and industrial managers**

## KEY FACTS



### Organization

- **Date:** October 2020 – December 2021
- **Starting date:** October 10, 2020
- **Frequency:** 9 online modules e 3 in-presence modules (Thur - Sat full day).

Minimum attendance of 70% is foreseen.



### Headquarters

Politecnico di Milano - Polo Territoriale di Lecco

Some of the on-site days will be hosted by the clinical centers involved in the organization.



### Awarded Title

I level (for participants with Bachelor Degree) or II level (for participants with Master of Science) Master's degree in RehabTech: Technologies for innovation in rehabilitative medicine and for assistance.

The Master is characterized by 60 ECTS.

# BLENDING TEACHING METHODOLOGIES

The Master consists of **12 monthly modules** from October 2020 to December 2021: **9 online modules, and 3 in-presence modules**. The Metid supports online teaching (<https://www.metid.polimi.it>).

The **professional experience** of the individual is **enhanced and shared with the community of participants**.

The **online modules consist** of:

- One day in a virtual classroom (Saturday), which includes lectures/webinar, case discussions, and simulations.
- 9 short pre-recorded video lessons accompanied by teaching materials, focused on a micro topic of the which guide the student's autonomous study.
- A practical work on the contents of the module.

The **in-presence modules** consist of:

3 full days (Thursday – Saturday) of lectures, round tables, laboratory activities, visits to laboratories, rehabilitation centers, or companies.

The Master foresees a **Project Work (19 CFU)**: a final thesis project, developed in groups, supervised by one of teachers of the Master, and to be presented by December 2021.

# SYLLABUS

The Master consists of six teaching units:

•**From basic neuroscience to rehabilitation clinic (2 CFU):** biological bases of function recovery.

•**From the experiential evaluation of the clinician to scientific evidence (6.5 CFU):** Technologies for diagnostics and ergonomics assessment.

•**From clinical practice to the design of new technologies (13 CFU):** definition of technical specifications: robotics, exoskeletons, virtual reality, neuroprostheses, and digital solutions in rehabilitation. Architectural needs of the living Environments.

•**From technology to patient and caregiver engagement (4 CFU)**

•**From the research prototype to clinical translation and industrial success (8.5 CFU):** technology transfer, innovation management, and Health Technology Assessment. Clinical translation: methodologies for the design of clinical trials and systematic reviews.

•**From new technologies to clinical service (4 CFU):** regulations, management and health organization for the uptake of new high-tech healthcare services.

**Soft skills (3 CFU):** communication, interdisciplinary team management, conflict management, leadership.

## Calendar of Activites

	2020						2021								
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Online	[Active]														
In-presence	[Active]														
Project Work	[Active]														

## Costs

The participation fee for the Master, exempt from VAT, is 5,000 euros, divided into two annual installments:

- 1st installment: 1.500 euros by 10-02-2020
- 2nd installment: 3.500 euros by 01-31-2021

## Scholarships

For the first edition of the Master, also as a result of the health and economic emergency related to the Covid-19, attendance supports will be available according to the evaluation of the Master's Committee. It is necessary to apply for them during the enrolment phase.

**Main sponsor: UNIVERLECCO**

## Language

The main language is Italian. Some lectures will be in English. International participants are required to understand Italian, but they can interact with peers and teachers in English, upon their convenience.

## Application

The application form has to be sent to **master-rehabtech@polimi.it** by **09-24-2020** (<https://www.polimi.it/en/programmes/how-to-apply/>).

Admission to the Master is based on the evaluation of the curriculum.

The Master will be delivered upon reaching 35 participants.

## Professional credits

This Master of 60 ECTS provides the accreditation for Continuing Education Unit and Continuing Medical Education credits according to the "Manual on the continuing education of health professionals" - Paragraph 4.1.



0341.488743

master-rehabtech@polimi.it



<https://www.polimi.it/en/programmes/specializing-masters-and-postgraduate-programmes/>



Polo Territoriale di Lecco

Via Gaetano Prevati, 1/c, 23900 LECCO