



# FACOLTA' DI INGEGNERIA DI PISA

## ATTIVITA' FORMATIVE A.A. 2021-2022

### Laurea Magistrale

### BIONICS ENGINEERING

#### Sezione 1: Manifesto degli studi

Anno di corso	[SSD]	CFU		Per	Note	Lab
<b>Denominazione</b>						
<b>Primo anno</b>						
Methods and techniques of measurement and data analysis	ING-INF/06	6		2		
Statistical Signal Processing	ING-INF/03	6		1		
Bioinspired Computational Methods	ING-INF/05	6	6	1+2	1	
Analysis of bionic and robotic systems	[ING-INF/06,ING-IND/34]	6	6	1+2	2	
<b>Neural Engineering (12CFU)</b>						
Applied Brain Science	[INF/01,ING-INF/06]	6	6	1+2	3	
<b>Biorobotics (12 CFU)</b>						
Bioinspired and soft robotics	ING-IND/34	6	6	1+2	4	
A scelta dello studente		12		1+2		
<b>Secondo anno</b>						
Prova finale		15				
Lab training		3				
<b>Neural Engineering (42CFU)</b>						
Interactive Systems and Affective Computing	[INF/01, ING-INF/06]	6	6	1+2	5	
Neural Prostheses	ING-INF/06	6	6	1+2	6	
Integrative Cerebral Function and Image Processing	[MPSI/02,ING-INF/06]	6	6	1+2	7	
Bionic Senses	ING-INF/06	6		1		
<b>Biorobotics (42 CFU)</b>						
Design principles for bionic tissue engineering	ING-INF/06	6		1		
Wearable robotics	ING-IND/34	6	6	1+2	8	
Rehabilitation and assistive technologies	ING-IND/34	6	6	1+2	9	
Advanced interventional and therapeutic technologies	ING-IND/34	6	6	1+2	10	

#### Dettagli insegnamenti integrati (nota INT)

Insegnamento Integrato o plurisetoriale	Modulo (solo se integrato)	[SSD]	CFU	Per.
1) Bioinspired Computational Methods	Neural and Fuzzy Computation	ING-INF/05	6	2
	Biological Data Mining	ING-INF/05	6	1
2) Analysis of bionic and robotic systems	Principles of bionics and biorobotics engineering	ING-IND/34	6	1
	Modeling of multi-physics phenomena	ING-INF/06	6	2
3) Applied Brain Science	Behavioural and Cognitive Neuroscience	ING-INF/06	6	1
	Computational Neuroscience	INF/01	6	2
4) Bioinspired and soft robotics	Mechanics of smart materials and structures	ING-IND/34	6	1
	Soft robotics technologies	ING-IND/34	6	2
5) Interactive Systems and Affective Computing	Interactive Systems	INF/01	6	1
	Affective Computing	ING-INF/06	6	2
6) Neural Prostheses	Neural Tissue Engineering	ING-INF/06	6	1
	Neural Interfaces and Bioelectronic Medicine	ING-INF/06	6	2
7) Integrative Cerebral Function and Image Processing	Integrative Cerebral Function	MPSI/02	6	2
	Advanced Image Processing	ING-INF/06	6	1
8) Wearable robotics	Prostheses	ING-IND/34	6	1
	Exoskeletons	ING-IND/34	6	2
9) Rehabilitation and assistive technologies	Biomechanics of human motion	ING-IND/34	6	1
	Robotic and data-driven rehabilitation	ING-IND/34	6	2
10) Advanced interventional and therapeutic technologies	Robotics for minimally invasive and targeted therapy	ING-IND/34	6	1
	Bionic organs and tissues	ING-IND/34	6	2

#### Sezione 2: Dettagli attività a scelta

##### Insegnamenti dell'Ateneo consigliati come attività a scelta dello studente

Insegnamento	[SSD]	CFU	Per.	Note
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Robot programming frameworks and IoT platforms	ING-IND/34	6	1
Electronics for Bionics engineering	ING-INF/01	6	2
Advanced materials for bionics	ING-IND/34	6	2
Neuromorphic engineering	ING-IND/34	6	1
Artificial intelligent systems for human identification	ING-INF/06	6	1