



UNIVERSITA' CAMPUS BIO-MEDICO DI ROMA

Student Handbook

Academic Year 2023/2024



Department of Engineering

Bachelor's Degree Programme in Biomedical Engineering

SYLLABUS AND ORGANISATION

DEGREE COURSE STRUCTURE

The Biomedical Engineering Degree Course (class L 8) is offered entirely in English.

The Degree Course uses engineering methodologies and technologies to describe, understand and solve problems of medical-biological interest through close interdisciplinary collaboration between the Departmental Faculties of Engineering and Medicine and Surgery of the University.

The initial part of the training course (1st and 2nd year) is strongly oriented towards basic preparation, in which the student acquires the essential elements of the scientific disciplines which constitute the indispensable foundations of Engineering studies. In the first year, basics of mathematics, physics and chemistry are accompanied by the teaching of Physiology and Anatomy (provided by teachers of the Departmental Faculty of Medicine and Surgery) which constitutes the foundation for the specific contents of the subsequent biomedical engineering courses.

In the final part of the course (third year), students are provided with updated tools and methods to solve analysis/design problems relevant to Biomedical Engineering.

The methodological rigor of the basic teaching approach is aimed at developing the student's aptitude for logical-scientific reasoning.

Among the teaching activities, as for all the University Bachelor's and Master's Degree courses, there are courses that aim to provide the conceptual tools, borrowed from ethical, deontological, epistemological and historical-philosophical principles and methods, which contribute to training of a critical spirit of the student.

The presence of teaching laboratories and research laboratories allows the student to carry out experimental training activities that integrate the theoretical knowledge acquired through institutional teaching.

TRAINING GOALS

The objective of the Course of Study in Biomedical Engineering is to train a junior engineer with highly interdisciplinary knowledge who applies the disciplines and methods of engineering to the solution of problems of medical and biological interest.

Therefore, the graduate must possess solid basic knowledge, an adequate mastery of the general technical-scientific methods and contents of information engineering and industrial engineering and a good knowledge of the anatomy and physiology of the human body in order to integrate and harmonize these contents with those specific to bioengineering, also integrated with training activities in the medical area, which contribute to forming a professional figure capable of responding to the needs of the job market.

At the end of the degree course the student will also have adequate knowledge of devices and instrumentation for diagnosis, treatment, assistance and rehabilitation. Finally, he will have achieved adequate knowledge of the organization of patient management and care structures, hospital information systems and ethical and regulatory aspects.

OCCUPATIONAL OPPORTUNITIES

The graduate will find employment opportunities, both nationally and internationally, in the industries of the biomedical and pharmaceutical sector, producers and suppliers of systems, equipment and materials for diagnosis, treatment and rehabilitation, in public and private hospitals, and management service companies. of medical and telemedicine equipment and systems, in specialized clinical laboratories and in the freelance profession, in the ICT services of a healthcare facility.

Finally, they will be able to access higher levels of training (such as master's degrees or first level master's degrees).

For further information, please refer to the didactic regulations.

STUDY PLAN - COHORT YEAR 2023 - 2024
Bachelor's Degree Programme in Biomedical Engineering – 1° year

Subject	ECTS	SSD	Term	Propaedeutics
Fundamentals of Computer Science	10	ING-INF/05	II	<i>none</i>
Mathematics	10	MAT/08	I	<i>none</i>
Chemistry	7	CHIM/07	I	<i>none</i>
General Physics - <i>Physics Part 1</i>	7	FIS/07	I	<i>none</i>
General Physics - <i>Physics Part 2</i>	5	FIS/03	II	<i>none</i>
Economics and Management	6	ING-IND/35	II	<i>none</i>
General English/Italian	1	L-LIN/12	I	<i>none</i>
Humanities for Bioengineering - <i>The History of Biomedical Engineering in Twelve Machines</i>	1	MED/02	I	<i>none</i>
Physiology and Anatomy - <i>Physiology</i>	6	BIO/09	I	<i>none</i>
Physiology and Anatomy - <i>Anatomy</i>	4	BIO/16	I-II	<i>none</i>

Bachelor's Degree Programme in Biomedical Engineering – 2° year

Subject	ECTS	SSD	Term	Propaedeutics
Advanced Physics	6	FIS/03	I	Physics
Mathematics II	13	MAT/05	I-II	Mathematics
Probability and Statistics	6	SECS-S/02	I	<i>none</i>
Healthcare Information Systems and Telemedicine	6	ING-INF/05	I	<i>none</i>
Electronics and Electrotechnics - <i>Electrotechnics</i>	5	ING-IND/31	II	<i>none</i>
Electronics and Electrotechnics - <i>Fundamentals of Electronics</i>	6	ING-INF/01	II	<i>none</i>
Mechanics of Solids	6	ICAR/08	II	<i>none</i>
Transport Phenomena and Thermodynamics	6	ING-IND/24	II	<i>none</i>
Technical English/Italian	2	L-LIN/12	I	<i>none</i>
Humanities for Bioengineering - <i>Fundamentals of Anthropology and Ethics</i>	3	M-FIL/03	I-II	<i>none</i>

Bachelor's Degree Programme in Biomedical Engineering – 3^o year				
Subject	ECTS	SSD	Term	Propaedeutics
Biomedical Signal Processing	10	ING-INF/06	I-II	<i>none</i>
Automatic Control	9	ING-INF/04	I	<i>none</i>
Biomechanics - <i>Modeling and Technologies</i>	6	ING-IND/34	I	<i>none</i>
Biomechanics - <i>Physiology and Anatomy - Musculoskeletal System</i>	3	MED/34	I	<i>none</i>
Fundamentals of Bioengineering	12	ING-IND/34	II	<i>none</i>
Measurements and Instrumentation in Biomedical Engineering and Standards for Medical Devices	7	ING-IND/12	I	<i>none</i>
Humanities for Bioengineering - <i>Philosophy of Science, Human Development, and Technology</i>	2	M-FIL/02	I-II	<i>none</i>
To be chosen by the student ***	Total ECTS: 12			<i>none</i>
Thesis	3			<i>none</i>

*** EXAMS TO BE CHOSEN BY THE STUDENT FOR A TOTAL OF 12 ECTS					
YEAR	Subject	ECTS	SSD	Term	Propaedeutics
3rd	Biomechatronics and Biomaterials	6	ING-IND/34	II	<i>none</i>
3rd	Healthcare Robotics	6	ING-IND/34	II	<i>none</i>
3rd	AI and Data Mining	6	ING-INF/05	II	<i>none</i>
3rd	Biomedical Research and Innovation Management and Assessment	6	ING-IND/34	II	<i>none</i>
3rd	Laboratory fo Measurements	6	ING-IND/12	II	<i>none</i>

EDUCATIONAL ORGANISATION: Integrated Courses and Coordinators

<u>First Year</u>	Learning assessment	Credits I.C.	SSD	Credits SSD	Term	Coordinator
Fundamentals of Computer Science	exam	10	ING-INF/05	10	II	Sicilia Rosa
Mathematics	exam	10	MAT/08	10	I	Menci Marta
Chemistry	exam	7	CHIM/07	7	I	Giannitelli Sara Maria
General Physics	exam	12			I-II	Loppini Alessandro
Physics (part 1)		7	FIS/07	7		
Physics (part 2)		5	FIS/03	5		
Economics and Management	exam	6	ING-IND/35	6	II	Cappa Francesco
General English/Italian	exam	1	L-LIN/12	1	I	Centro Linguistico di Ateneo
Humanities for Bioengineering		3			I	Ghilardi Giampaolo
The History of Biomedical Engineering in Twelve Machines			MED/02	1		
Physiology and Anatomy	exam	10			I-II	Di Pino Giovanni
Physiology			BIO/09	6		
Anatomy			BIO/16	4		

<u>Second Year</u>	Learning Assessment	Credits I.C.	SSD	Credits SSD	Term	Coordinator
Advanced Physics	exam	6	FIS/03	6	I	Chiodo Letizia
Mathematics II	exam	13	MAT/05	13	I-II	Smarrazzo Flavia
Probability and Statistics	exam	6	SECS-S/02	6	I	Forti Marco
Healthcare Information Systems and Telemedicine	exam	6	ING-INF/05	6	I	Cordelli Ermanno
Electronics and Electrotechnics	exam	5			II	Pennazza Giorgio
Electrotechnics	exam		ING-IND/31	5		
Fundamentals of Electronics	exam	6	ING-INF/01	6		
Mechanics of Solids	exam	6	ICAR/08	6	II	Gizzi Alessio
Transport Phenomena and Thermodynamics	exam	6	ING-IND/24	6	II	Di Paola Luisa
Technical English/Italian	exam	2	L-LIN/12	2	I	Centro Linguistico di Ateneo
Humanities for Bioengineering	exam	3			I	
Fundamentals of Anthropology and Ethics			M-FIL/03	3		Ghilardi Giampaolo

ACADEMIC CALENDAR

SEMESTER	EDUCATIONAL ACTIVITIES	EXAMS SESSIONS	HOLIDAY BREAKS
I semester	From September 25, 2023 to January 20, 2024	1st session From January 8, 2024 To March 1, 2024	* Christmas Holydays From December 23, 2023 To January 5, 2024
II semester	From March 4, 2024 to May 24, 2024	2nd session From June 3, 2024 to July 31, 2024 3rd session From September 2, 2024 To September 26, 2024	* Easter Holydays From March 28, 2024 To April 2, 2024

* Holydays breaks start and end on the days indicated above.

Teaching activities are suspended during the following holidays:

Inauguration of the Academic Year (days to be defined)
 All Saints' Day: November 1st, 2023
 Immaculate Conception: December 8th, 2023
 Christmas Day: December 25th, 2023
 St. Stephen's Day: December 26th, 2023
 New Year's Day: January 1st, 2024
 Epiphany: January 6th, 2024
 Easter Sunday: March 31st, 2024
 Easter Monday: April 1st, 2024
 Liberation Day: April 25th, 2024
 Labour Day: May 1st, 2024
 Republic Day: June 2nd, 2024
 Saint Josèmaria Escrivà de Balaguer: June 26th, 2024
 Saint Peter and Saint Paul - only in Rome: June 29th, 2024

For more information, please get in touch with the Academic Services Office.