



APPLIED BIOELECTROMAGNETISM

Enrollment year	2020/2021
Academic year	2021/2022
Regulations	DM270
Academic discipline	ING-INF/02 (ELECTROMAGNETIC FIELDS)
Department	DEPARTMENT OF ELECTRICAL, COMPUTER AND BIOMEDICAL ENGINEERING
Course	ELECTRONIC ENGINEERING
Curriculum	PERCORSO COMUNE
Year of study	2°
Period	2nd semester (07/03/2022 - 17/06/2022)
ECTS	6
Lesson hours	45 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	PASIAN MARCO (titolare) - 6 ECTS
Prerequisites	Physics, in particular basic electromagnetism. Basic knowledge of biological tissues and organs.
Learning outcomes	This course is intended for the MS student in Bio-engineering. It provides the basic competences to understand the use of microwaves (and radio frequencies) in the field of bio-engineering, either for diagnostics or therapies. The student will understand how to manage and deal with this emerging technology.
Course contents	<ul style="list-style-type: none">- Fundamental aspects of the electromagnetism- Fundamental aspects of microwave devices and antennas- Dielectric characterization of biological materials- Dosimetry, specific absorption rate (SAR)- Regulations about electromagnetic fields- Interaction between electromagnetic fields and biological systems

	<ul style="list-style-type: none"> - Ex-vivo and in-vivo measurements - Numerical techniques for the analysis of the interaction between biological systems and microwaves - Imaging and diagnostic techniques at microwaves - Biomedical devices at microwaves - Implantable and wearable microwave devices
Teaching methods	<p>Lectures (hours/year in lecture theatre): 42</p> <p>Practical class (hours/year in lecture theatre): 8</p> <p>Practicals / Workshops (hours/year in lecture theatre): 0</p>
Reccomended or required readings	Material made available by the lecturer
Assessment methods	<p>Oral examination. The student is invited to prepare a short presentation about a topic of interest for him/her, deepening the comprehension of some aspects discussed during the course. Alternatively, the student is invited to present in detail his/her favorite topic. In any case, the second part of the exam comprises some questions about the overall course.</p>
Further information	
Sustainable development goals - Agenda 2030	<p>Goal 3: Ensure healthy lives and promote well-being for all at all ages</p> <p>\$Ibl legenda sviluppo sostenibile</p>