



BIOPHOTONICS B

Enrollment year	2018/2019
Academic year	2019/2020
Regulations	DM270
Academic discipline	FIS/03 (MATERIAL PHYSICS)
Department	DEPARTMENT OF ELECTRICAL, COMPUTER AND BIOMEDICAL ENGINEERING
Course	BIOENGINEERING
Curriculum	PERCORSO COMUNE
Year of study	2°
Period	2nd semester (02/03/2020 - 12/06/2020)
ECTS	3
Lesson hours	23 lesson hours
Language	Italian
Activity type	WRITTEN AND ORAL TEST
Teacher	MINZIONI PAOLO (titolare) - 3 ECTS
Prerequisites	Having passed Physics 2 exam, thus demonstrating a proper comprehension of the origin and properties of electromagnetic waves.
Learning outcomes	<p>The main goal of the course is to provide information about photonic techniques recently developed in the biomedical field for diagnosis and treatments.</p> <p>At the end of the course the student will be able to:</p> <ol style="list-style-type: none">1. Understand the different possibilities offered by photonic technologies2. choose the right components for different applications3. Develop critical comparisons between different techniques4. Properly communicate, by also using adequate graphical materials, the working principle of different photonic systems

5. Evaluate the possibility to modify an existing apparatus so as to comply with changes in the experimental needs.

Course contents

The course covers 10 main topics:
01- Short review of biological systems
02- Optical Imaging
03- Raman
04- Biosensors
05- Microfluidics
06- Optical trapping
07- Optical devices for cell manipulation
08- Acoustofluidics
09- Implantable biophotonic systems
10- Photo dynamic therapy

Teaching methods

Lectures (hours/year in lecture theatre): 23
The possibility to carry out some lessons directly at the Integrated Photonics Lab will also be evaluated

Recommended or required readings

We will mainly refer to scientific papers and on the slides used in the lessons
The material will be made available by using the course website

Assessment methods

The exams consists in a presentation prepared by the student in which a particular topic is treated in detail and on a general discussion about the techniques presented in the course

Further information

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Sustainable development goals - Agenda 2030

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