



BIOPHOTONICS

Enrollment year	2019/2020
Academic year	2021/2022
Regulations	DM270
Academic discipline	FIS/03 (MATERIAL PHYSICS)
Department	DEPARTMENT OF ELECTRICAL, COMPUTER AND BIOMEDICAL ENGINEERING
Course	BIOENGINEERING
Curriculum	PERCORSO COMUNE
Year of study	3°
Period	2nd semester (07/03/2022 - 17/06/2022)
ECTS	6
Lesson hours	60 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	MINZIONI PAOLO (titolare) - 6 ECTS
Prerequisites	Electromagnetic theory Physics 1 and 2 courses
Learning outcomes	Provide basic knowledge, both at a theoretical and laboratory level, in order to evaluate your interest in the large field of Biophotonics. In particular, in addition to the theoretical part, students will have the opportunity to directly carry out experiments and to put their hand on a whole series of tools, components and devices, which otherwise would remain only "on paper", so as to gain some confidence with the real activity of a laboratory.
Course contents	The course program covers various topics, starting from the basics of laser sources, up to modern applications - Laser sources (operation, types, general characteristics) - Propagation of laser light

- Optical components and basic phenomena
- Optical fibers and integrated optical guides
- Photonic semiconductor devices
- Biophotonic applications and light-biological material interaction

PLANNED EXPERIMENTAL ACTIVITIES:

- Image formation and light polarization
- Characterization of a laser beam
- Optical fibers
- Integrated optical guides
- Semiconductor laser
- Interferometry
- Optical analysis of fluids

Teaching methods

Lessons (hours / year): 38

Exercises -hours / year):-

Practical activities (hours / year): 22

During the lectures the different topics of the course will be presented, paying attention to illustrating both the basic concepts and the practical applications.

In the second part of the course students will be given the opportunity to carry out different laboratory experiences under the guidance of the teacher.t

Reccomended or required readings

V. Degiorgio, I. Cristiani. Note di Fotonica. Springer.

The course program is almost entirely covered by the content of this text.

B.E.A. Saleh, M.C. Teich. Fundamentals of Photonics. Mc Graw-Hill.

This text is very broad and rich. It is recommended for those who want to deepen some topics of the course.

Assessment methods

Oral discussion, starting from the report on one of the experimental activities carried out.

Further information

Sustainable development goals - Agenda 2030

[The goals](#)