UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Interaction Between Medicine and Biomedical Engineering in Diagnosis and Therapy

2526-3-H4101D319

Aims

The goal of this course is to focalize the attention of future doctors to the recent scientific and technological innovations in light of the fundamental need that the development of knowledge and the improvement of medical practice is deeply linked to the training process of young doctors in STEM disciplines

1. Knowledge and understanding: it is essential that all medical students receive sufficient exposure to recent scientific and technological innovations in light of the fundamental need for the development of knowledge and the improvement of medical practice to be deeply linked to the training process of young doctors in STEM disciplines
2. Applied knowledge and understanding: the material is presented in a context that prepares students for the profession, therefore, when possible, clinical examples will be used to illustrate the principles of the instruments and techniques applied in the medical-diagnostic context.
3. Autonomy of judgment: knowing how to interpret the morpho-functional anomalies found in different diseases with the aid of the latest generation interventional and diagnostic techniques
4. Communication skills: acquisition of the set of skills that allow one to interact effectively with others, both verbally and non-verbally.
5. Ability to learn: acquisition of basic knowledge of the functioning of interventional/diagnostic instruments in clinical medical practice.

Contents

Presentation of selected topics to illustrate the importance of the contribution of biomedical engineering in the clinical context. Through the interdisciplinary collaboration between medical engineers and biologists (physiology), the methodologies and technologies of Biomedical Engineering it is possible to describe, understand and, to a large extent, solve the problems of medical-biological interest. Providing usable tools of the STEM disciplines in

diagnostics and therapy.

Detailed program

1) SIGNAL PROCESSING (ECG)

2) MEDICINE IMAGING

3) 3D RECONSTRUCTION (scanner - bioprinters)

4) BIOSENSORS

5) NEW FRONTIERS.

Prerequisites

The course is intended for students from the third year of the Master course

Teaching form

All the 7 hours of lesson are held in person in delivery mode (direct instruction): the teacher begins with a first part in which concepts are exposed (direct mode) and then an interaction opens with the students which defines the next part of the lesson (interactive mode).
The teaching methods will include lectures, videos, and class discussions:
Signal analysis - machine learning (2,5 hours)
Artificial Intelligence (2,5 hours)
Da Vinci System (2 hours):
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Textbook and teaching resource

Introduzione all’ingegneria biomedica (E. Biondi, 1997)

Semester

Second semester, march/aprile

Assessment method

Self assessment test assessing the achievement of the objectives and the level of knowledge of the experimental techniques and procedures covered by the course

Office hours

By appointment, arranged by e-mail giulio.sancini@unimib.it

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION | GENDER EQUALITY