UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Medical Physics

2627-1-I0105D004-I0105D00401

Aims

The general aims of the course are to provide students with basic knowledge of Physics, and Physics of radiation, necessary to carry on their profession

1. Knowledge and Understanding
   Acquire the fundamental principles of medical physics, including the physical basis of biological processes, healthcare technologies, and radiation protection.

2. Applying Knowledge and Understanding
   Apply physical principles to understand biomedical devices, interpret basic clinical phenomena, and ensure safe professional practice.

3. Making Judgements
   Critically evaluate healthcare situations involving physical principles and medical technologies, promoting safe and appropriate practice.

4. Communication Skills
   Use appropriate scientific terminology to communicate concepts of medical physics with colleagues and other healthcare professionals.

5. Learning Skills
   Develop independent learning skills to update knowledge and integrate physics concepts into professional healthcare education.

Contents

The course aims to provide the basic principles of biophysics and medical physics needed to understand the biophysical mechanisms underlying the more relevant physiological processes.

Detailed program

Physical quantities. Conversions between physical quantities. Unit of measurement and changes of the unit of measurement. Vector and scalar quantities. Operations with vectors and vector properties. Concept of force, moment of a force. Equilibrium of a rigid body, examples of the equilibrium of the human body. The levers and their application: lever gain. Elements of statics of rigid bodies. Statics and dynamics of fluids: ideal fluids and real fluids; Archimedes, Stevin, Bernoulli, Poiseuille laws; Reynolds number and turbulence; applications of fluid dynamics to cardiovascular system. The structure of the atomic nucleus: radioactive decay (alpha radiation, beta +, beta -, gamma); law of radioactive decay; radioactivity (Becquerel, Curie); X-ray and production of X-rays; Law absorption of X-rays; elements of dosimetry.

Prerequisites

Basic knowledge of Mathematics.

Teaching form

Frontal lectures and blended learning.

Textbook and teaching resource

Scannicchio D. Giroletti E. (2015) Elementi di Fisica Biomedica, Edises, Milano.

Semester

1st Year, 2nd Semester

Assessment method

Written exam. A quiz with 33 questions will be proposed with 4 possible answers of which only one is the correct one

Office hours

On appointment

Sustainable Development Goals

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