

Faculty of Medicine



MED1001 Elements of biophysics

[15h+2.5h exercises] 3 credits

Teacher(s): Bernard Piraux
Language: French
Level: First cycle

Aims

The aim of this course is twofold : on the one hand, to encourage the students to apply the fundamental laws and principles they saw in their physics course to situations closely related to biology and medicine; on the other hand, to introduce new concepts in physics that play an important role in physiology, radiotherapy and medical imaging.

Main themes

The course is divided in three sections. The first section is devoted to the physics of radiations and in particular to the study of the interaction of particles and light with matter within a medical context. The second section, entitled medical imaging gives a general introduction to the modern techniques of medical imaging. The third section is about physics applied to physiology. Physical aspects of hearing and vision are studied

Content and teaching methods

Section I : Physics of radiations

- electromagnetic waves and their production (laser #)
- radioactivity
- particles and light interaction with matter
- radioprotection
- nuclear medicine.

Section II : Medical Imaging

- electronic microscope
- images and information
- scanner
- tomodensimetry
- nuclear magnetic resonant
- echography.

Section III : Physics applied to physiology

- physical aspects of hearing
- acoustics
- physical aspects of vision.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Prerequisite : course of experimental physics and mathematical introduction to experimental sciences (1st and 2nd part).

Evaluation : written exam.

Support : syllabus, slides, software, labs for group of 20 students.