Level: bachelor

Course title: Bioelectricity

Status: elective

ECTS: 6

Requirements: Electromagnetism

Learning objectives

Introduction to the principles and application of electrical, magnetic, and electromagnetic phenomena in living organisms.

Learning outcomes

- Knowledge of basic principles of measurement and modelling of electromagnetic properties of biological tissues.
- Introduction to the principles of electric and magnetic therapeutic methods.
- Understanding of the complex relationships between biological systems and devices for measuring various parameters.

Syllabus

Theoretical instruction

The concept of bioelectromagnetism. Anatomical and physiological basis of bioelectromagnetism. Electrical and magnetic properties of the biological tissue. Electrical and magnetic properties of the biological tissue. Electrical properties of the cell membrane. Action potentials. Bioelectric function of nerve cells. Electrical activation of the heart. Bioelectric sources and conductors. Modelling of bioelectric sources and conductors. Model registration of bioelectrical activity. The human body as a volume conductor. Current flow through the biological system. Polarization of the membrane. Electric and magnetic measurements of the electrical activity of tissue. Electrical stimulation of the heart.

Practical instruction

The exercises that follow the content of lectures.

Weekly teaching load				Other:
Lectures: 3	Exercises: 1	Other forms of teaching: 1	Student research:	