

Medical physics - advanced exercises

Course Objectives

At the end of this course students should be able to: use information technology for searching and sorting of professional information; operate advanced diagnostic and laboratory devices; evaluate data obtained by the biophysical methods in view of a scientific, effective, safe and efficient approach to their use; distinguish between possible uses of biophysical techniques and medical devices in practice

Practical Exercises

Seminar

Future of information technology in medicine. Searching for scientific information.

Safe and effective usage of diagnostic and therapeutic methods.

Computerized simulations in medical education.

Nanotechnology in medicine.

Luminiscence and lasers in medicine. Fluorescent microscopy.

Experimental tasks

1. Measurement of electromagnetic parameters of the environment – measurement of magnetic field and quantification of external sources of electromagnetic radiation.
2. Measurement of blood flow velocity in peripheral arteries.
3. Diagnostic ultrasound – color flow mapping and spectral Doppler.
4. Diagnostic ultrasound – use of tissue phantoms and 3D imaging.
5. Thermography – cooling test.
6. Thermography – emissivity measurement.
7. Evaluation of parameters of X-rays.
8. Perimetry and corneal topography.
9. Spectrophotometry and electrophoresis of nucleic acids.

Assessment methods

The basic requirement in order to complete this course is full attendance of practical seminars.. For every task students must elaborate a report including critical assessment of used methods.