

Medical physics and health informatics

Teacher(s)	Mgr. Erik Staffa. Ph.D.; doc. Mgr. Vladan Bernard, Ph.D.; Mgr. Daniel Vlk, CSc., MUDr. Aleš Bourek, PhD.		
Department/Faculty	Department of Biophysics, Faculty of Medicine	Field/Keywords	medical physics, nuclear medicine, imaging methods, elementary biophysics, healthcare quality management, health informatics
Academic Level	Bachelor		

Course Description

Student will receive basic education in medical physics with a focus on imaging methods and their aspects covering also safety issues. The course will include basics of health informatics and its important role in healthcare systems. The course will focus mainly on practical skills with real medical instruments (for example diagnostic ultrasound, electrocardiography, doppler ultrasound, thermography, etc.) and partly on lectures to provide a theoretical background.

Lecture Topics

Introduction to the medical physics, introduction to health informatics

Topics included:

- Methods of detection and measurement electromagnetic radiation (including ionizing radiation)
- methods of ultrasound imaging
- X-rays imaging methods
- MRI imaging – visit of the MRI center
- methods of measuring of electric biosignals (including ECG measurement)
- optical laboratory methods (spectrophotometry, refractometry, polarimetry)
- microscopy (light microscopy, fluorescence microscopy)
- measurement of biosignals (blood flow, blood pressure, audiometry, etc.)
- eye examination (optotype, keratorefractometry, intraocular pressure, etc.)
- medical infrared thermography course
- 3D modeling and 3D printer
- health informatics, healthcare quality management
- patient and hospital databases and data processing

The course will consist of 10 individual lecture topics, covering the above topics.

Pre-Requisites

- No academic pre-requirements, suitable for applicants for medicine study. Knowledge of physics and biology at the secondary school level