Level: master

Course title: X-rays in medicine

Status: obligatory

ECTS: 6

Requirements: none

Learning objectives

The objective is to qualify students for understanding the physics related to application of x-rays in medicine.

Learning outcomes

Students should acquire knowledge and ability for individual and team scientific research work in the field of radiological physics based on the application of x-rays. The expected competences are:

1. General skills: understanding the nature and methods related to application of physics in medicine; capability to work in the interdisciplinary team consisting of physicians, physicists; understanding and solving problem related to application of x-ray in medicine; capability to present results of the research.
2. Specific skills: understanding and interpretation of physical properties of production of x-rays, imaging systems, the image formation process for each modality as well as other application of x-rays in medicine; understanding of interaction of x-rays with human tissues, biological effects of radiation; responsibility for radiation protection.

Syllabus

Theoretical instruction

X-ray production, generators, x-ray spectrum, interaction of x-rays with matter, attenuation of x-rays, scattered radiation; Image receptors; Image quality; physics and methods for evaluation of image quality; Conventional radiography, film processing; Fluoroscopy, interventional procedures in radiology and cardiology; Mammography; Digital radiology; Computed tomography; Other methods based on application of x-rays (DEXA, tomosynthesis, etc.); Dosimetric quantities and units, dose assessment; Radiation protection, quality assurance and quality control; x-rays in radiation therapy.

Practical instruction

Implemented in the clinical environment, i.e. at radiology departments of hospitals. The visit will provide insight in the application of x-rays in medical diagnostic and therapy. Part of practical related to x-ray diffraction is performed in laboratories of the department of physics.

Weekly teaching load				Other:
Lectures: 2	Exercises: 1	Other forms of teaching:2	Student research:	