Level: master

Course title: Biomedical Modelling

Status: elective

**ECTS**: 9

#### Requirements: none

### Learning objectives

The objective is to qualify students for understanding the part of medical physics related to biomedical modelling.

# Learning outcomes

Students should understand the methodologies of biomedical modelling. Through this course, students will learn the basic concepts and fundamental techniques of mathematical modelling and how the methodologies are used in biological and biomedical modelling through various physiological case studies.

## Syllabus

Theoretical instruction

The organization and computer architecture (memory, computer classes).

Development and the basis of higher programming languages (machine language, a division of higher programming languages, functional and technical specifications).

The structure and management of data (categories of data, files, records and fields, sorting and searching).

Basic concepts of cybernetics. Artificial Intelligence. Simulation of physical experiments on the computer. Computer graphics and text editing on the computer. Fundamentals of statistical methods in physics and medicine. Computer models of biological systems. Monte-Carlo methods in radiation therapy.

Seminar

Detailed analysis of the issues selected from some of the abovementioned areas.

## Practical instruction

Practical classes will be held at the Department of Physics and the Department of Mathematics and Informatics. The classes will describe simulation of physical experiments on a computer using higher programming languages. Monte-Carlo method will be demonstrated at the Institute of Cardiovascular Diseases in Sremska Kamenica (Department of Radiotherapy).

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