Course title: Nuclear Methods in Medicine

Lecturer: Nataša Todorović

Required Course: elective

Number of ECTS: 15

Prerequisites: Modern Experimental Physics III, Nuclear Physics

Course Objective:
To introduce the students with skills in applied nuclear physics in medicine.

Course Outcome:
Upon completion of the course student should have developed:
- General skills: Students learn about the application of nuclear physics.
- Specific skills: Certain technologies will be further developed so that knowledge can later be applied in practice

Course Content:
Radioisotopes in medicine. Production of radioisotopes. The interaction of radiation with matter. Basic principles of measuring radioisotope irradiation. Basic diagnostic procedures. Measurement techniques: linear scanner, gamma camera, PET. Quality assurance. The effect of ionizing radiation on living organisms. Fundamentals of radiobiology radiation therapy, open sources. Fundamentals of dosimetry. Physical protection from radiation.
Radiological Physics. Production and basic properties of X-rays. Interaction of low-energy x-rays with matter. The physical principles of x-ray diagnostics. Production of high energy electromagnetic radiation: therapeutic radioisotopes, betatron, linear accelerators. The interaction of highenergy radiation with matter. Absorption and measurement of radiation in radiotherapy, absorbed dose. Physical principles and planning of radiation therapy. Quality assurance

Reading List:

1. J.A. Sorensen, M.E. Phelps: Physics in Nuclear Medicine, Sounders Publishing, Philadelphia (1987)
2. J.M. McAlister: Radionuclide Techniques in Medicine, Cambrige University Press, Cambrige (1995)
3. H.E. Johns, J.R. Cunningem: The Physics of Radiology, Charles C. Thomas Publisher, Springfield (1979) 1. V. Paić, G. Paić: Osnove radijacione dozimetrije i zaštite od zračenja, Zagreb (1983)
4. J.R. Greening, Fundamentals of Radiation Dosimetry, IOP Publishing, Bristol (1992)

Total hours:		10	
Lectures: 5	Practicals:	Other:	Student research work: 5

Methods of instruction:
Lectures, exercises and presentation of seminar work.

Assessment (maximum number of points 100)

Requirements
Active participation in lectures 5 pts, Active participation in practicals 20 pts, Seminar work 25pts
Oral exam 50pts