

Study Program: Physics			
Type and level of studies: Bachelor studies			
Course name: Experimental Methods in Physics			
Lecturer: Adrović D. Feriz			
Status: Compulsory			
ECTS: 4			
Attendance prerequisites: Electromagnetism 1, Electromagnetism 1			
Course aims			
Introducing students to the selected methods of modern experimental physics, elaboration of fundamental principles and methodology that physics students can apply in various areas of interest.			
Course outcome			
Grasping the laws of physics and physical phenomena, theoretical concepts and experimental achievements in selected experimental methods of modern physics.			
Course content			
<i>Theoretical part</i>			
Physical characteristics of ultrasound. Ultrasonic waves, plane wave, spherical wave, ultrasonic beam. Reflection, wave scattering. Wave intensity and energy. The impedance of spherical wave transmitter. Production of ultrasonic beams, piezoelectric effect. Nature and origin of X-rays. X-ray properties. Scattering, absorption, refraction and x-ray monochromatization. Coherent scattering of x-rays by atoms. Laue- conditions and Bragg's interpretation of diffraction. X-ray technique. X-ray cabinet and operation. Analogy and digital X-ray machines. Basics of X-ray imaging. Basics of X-ray diagnostics. X-ray examination methods. Radiography: equipment, the role of current and voltage, imaging. Natural and artificial contrast agents in X-ray diagnostics.			
<i>Practical part</i>			
Experimental exercises will be realized at clinics.			
Literature			
<ol style="list-style-type: none"> Adrović F: Fizika - odabrana poglavlja iz optike, atomske i nuklearne fizike, Kopigraf Tuzla, Tuzla, 2006. Fish P: Physics and Instrumentation of Diagnostic Medical Ultrasound, Wiley & Sons, John, Incorporated, 1990. Greenleaf J F: Tissue Characterization with Ultrasound, Vol.1: Methods CRC Press, 1986. Shung K K: Ultrasonic Scattering in Biological Tissues, CRC Press, 1992. Johns H E, Cunningham J R: The Physics of Radiology, 4th ed. Charles C. Thomas, Springfield, Illinois, USA, 1983. Hebrang A, Lovrenčić M (Ur.): Radiologija, Medicinska naklada 2001. 			
Number of active classes			Other classes
Lectures: 1	Practical classes: 2	Other forms of teaching:	
Teaching methods			
Lectures (1 class per week during the semester), experimental exercises at clinics (2 classes per week) during the semester).			
Assessment (maximum 100 points)			
Course assignments	points	Final exam	points
Lectures	10	written exam	
Laboratory exercises	20	oral exam	50
Seminars	20	
Total	50		50