

<b>Study programme:</b> BSc in Biology			
<b>Level:</b> bachelor			
<b>Course title:</b> Biophysics			
<b>Lecturer:</b> Prof. dr. Jovan P. Šetrajčić			
<b>Status:</b> obligatory			
<b>ECTS:</b>			
<b>Requirements:</b>			
<b>Learning objectives</b> Training of students for indirect involvement in the contemporary mainstream research in one of the most un-investigated areas			
<b>Learning outcomes</b> Introduction to the laws of natural phenomena and properties of materials with the basis and application in biophysical problems.			
<b>Syllabus</b> <i>Theoretical instruction</i> Phenomena in nature, laws, principles and fundamental interactions. Physics, technique, technology and survival of mankind. Place and role of biophysics. Fundamentals of metrology. Non-relativistic movement. Gravitational field. Locomotor system of humans/animals. Mechanics of bodies and fluids. Flying and swimming of animals, biocapillarity and chemo dynamical system of man. Oscillations, waves and sound. Speaking and hearing system of man and animals. Thermodynamics, aggregate states and phase transitions. Active transport of substance, bio-membranes. Heat and acoustic properties of materials. Electrostatics and electrodynamics. Electromagnetism. Bioelectricity, biocurrents at man/animals, biomagnetism. Electromagnetic waves. Optics, photosensitivity of men and photometry. Atoms, ions and molecules. Emission and absorption of light. Bio and photoluminescence. Radioactivity. Interaction of ionized radiation with living and nonliving matter. Detection, dosimetry and protection of damage radiation.			
<i>Practical instruction</i> Experimental exercises : <ul style="list-style-type: none"> <li>• First part – determination of: density of bodies and liquids, coefficient of surface tension viscosity, humidity and confirmation of Boyle-Mariotte law</li> <li>• Second part – determination of: electromotor force of battery, dimensions of micro-samples, focus (image point) of lens, concentration of sugar in solution, wave length and confirmation of Ohms law.</li> </ul>			
<b>Literature</b> <ol style="list-style-type: none"> <li>1. J.P.Šetrajčić, D.Lj.Mirjanić: Biofizičke osnove tehnike i medicine, ANURS, Banja Luka 2012.</li> <li>2. I.Janić, D.Mirjanić, J.Šetrajčić: Opšta fizika i biofizika, <i>Matićgraf</i>, Banja Luka 1993.</li> <li>3. J.P.Šetrajčić, S.M.Vučenović, D.Lj.Mirjanić: Praktikum vežbi iz fizike, <i>Med.fakultet</i>, Banja Luka 2006.</li> <li>4. J.P.Šetrajčić, S.M.Vučenović, D.Lj.Mirjanić: Zbirka testova iz fizike, <i>Med. fakultet</i>, Banja Luka 2006.</li> </ol>			
<b>Weekly teaching load</b>			Other:
Lectures: 3	Exercises: 3	Other forms of teaching:	
Student research:			
<b>Teaching methodology</b> Lectures, projection of movies, experimental problems, tests, seminars			
<b>Grading method (total number of points 100)</b>			
<b>Pre-exam oblications</b>	<b>points</b>	<b>Final exam</b>	<b>points</b>
practical	14	oral exam	2 x 10 = 20
tests	2 x 15 = 30	Activities during lectures	Up to 6
colloquia	3 x 10 = 30	(add/remove categories if necessary)	
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