UNIVERSITY OF NOVI SAD
FACULTY OF MEDICINE

Study program: Integrated Academic Studies in Pharmacy

Course title: Biophysics

Teacher: Nataša Todorović, Jovana Nikolov, Teodora Gajo

Course status: compulsory

ECTS Credits: 4

Condition: -

Course aim

The aim of the course is for the students to learn fundamental theoretical and practical knowledge in the field of physics necessary to acquire knowledge in farmaceutical subjects.

Expected outcome of the course:

Introduction to basic principles of general physics and modern applications of physics in understanding biomedical phenomena. Interdisciplinary connections. Expansion of already acquired knowledge, processing the basic laws of physics on a higher technical and scientific level in order to understand the content of vocational subjects taught during the study. The student will be able to successfully understand the contents of vocational subjects, and the principles of modern diagnostic and laboratory instrumentation (gamma camera, positron-emission tomography, ultrasound,...).

Course description

Theoretical education

Mechanics (kinematics, dynamics, work and energy, gravity, mechanics of solid bodies, statics, the elasticity of solids, energy bone fractures, oscillations, statics of liquids and gases, wave motion, acoustics, physics of ultrasound diagnostics, molecular transport processes).

Thermophysics and thermodynamics (temperature and heat expansion of the body, the kinetic theory of heat, kinetic theory of gases, the distribution of energy over degrees of freedom, heat and internal energy, gas laws, the first and second law of thermodynamics, the laws of thermodynamics and the human body).

Electromagnetism (electrostatics, electricity, electromagnetism, bioelectric processes in the human body).

Optics (nature of light, photometry, geometrical optics, wave optics, optical instruments).

Physical phenomena in the micro-world (quantum properties, radiation of atoms, the wave nature of matter, the stationary state of particles, the basic physics of atoms and molecules, the physics of the nucleus and its application, the sources of ionizing radiation, the biological effects of ionizing radiation, dosimetry and protection from ionizing radiation).

Practical education

Surface Tension, Viscosity Fluids, Humidity, Mathematical Pendulum, The Gas Laws, Speed of Sound, Ohm's Law in Single Circuit Electricity, Measuring Temperature Coefficient of Resistance Using Wheatstone bridge, Determining the Focal Length of Lenses, Measuring Length, The Emission Spectra, Optical Rail, Photometry, Electrolysis, The Absorption of Gamma Radiation.

Literature

Compulsory

1. Robert G. Brown, Introductory Physics I, Duke University Physics Department, 2013.
2. College Physics, Student Solutions Manual, OpenStax College
3. Online Physics Tutorials, http://www.physicstutorials.org/home/exams
4. Introductory Physics Laboratory Manual, Physics Department, The City College of The City University of New York

Number of active classes	**Theory:** 30	**Practice:** 30

Teaching methods Theoretical (lectures, PowerPoint presentations), computer tasks, experimental (lab)

Student activity assessment (maximally 100 points)

Pre-exam activities	**points**	**Final exam**	**points**
Lectures	10	Written	35
Practices	10	Oral	35
Colloquium	10	.....	
Essay			