Course Unit Descriptor

Study Programme: Veterinary medicine

Course Unit Title: Biophysics

Course Unit Code: 19ИВМ00001О002

Name of Lecturer(s): Assoc. prof. Branislava Lalić, Assist. Prof. Igor Balaž

Type and Level of Studies: Undergraduate studies

Course Status (compulsory/elective): Compulsory

Semester (winter/summer): Winter

Language of instruction: English

Mode of course unit delivery (face-to-face/distance learning): Face-to-face

Number of ECTS Allocated: 3

Prerequisites: None

Course Aims:

Biophysics, as interdisciplinary research field, enables to understand physiological process within cells and organisms using holistic approach. Linking these processes with thermodynamic aspects of life and physical principles broadly employed in therapeutic and diagnostic medical methods, biophysics represents ground base of veterinary medicine particularly in use of contemporary clinical methods.

Learning Outcomes:

Both lectures and lab exercises in biophysics for veterinary students are aimed at giving them the basic scientific and technical knowledge needed in order to understand main physiological process on different scales: from animal cell to organism as a whole. Lectures dealing with basic physical laws and principles are illustrated with examples from veterinary practice in order to introduce concept of application and problem solving from the very beginning. Practical exercises are focused on basics of physical measurements and measurement techniques, data analysis and calculation of measurement error.

Syllabus:

Theory

Systemology; System definition and classification; Biomechanics; Acoustics; Thermodynamics; Electricity and magnetism; Transport processes; Molecular physics; Oscillations and wave motion; Electromagnetic radiation; Optics; Biophysics of ionizing radiation.

Practice

Introduction; Physical quantities, units, errors of measurement; Measurement techniques; Length and volume measurement; Mass measurement; Density measurement and calculation techniques; Friction coefficient determination; Surface tension coefficient determination; Determination of thermal expansion coefficient of air; Specific heat determination; Measurements in optics; Electrical measurements – resistance of conductor; Absorption of gamma radiation in lead; Numerical exercises.

Required Reading:

1. Thompson, K., Stewart, M., Rodriguez, J., 2009: Lecture notes by biophysics & bio-imaging, College of Lousiana, pp. 128

2. Damjanovich, S., Fidy, J., Szöllősi, J., 2009: Medical Biophysics, Medicina, Budapest, ISBN: 9789632262499

Weekly Contact Hours: 4	**Lectures:** 30	**Practical work: 30**

Teaching Methods:

Lectures and students group work

Knowledge Assessment (maximum of 100 points): 100

Pre-exam obligations	points	**Final exam**	points
Active class participation	0	written exam	20
Test I, II and III	30	oral exam	30
Preliminary exam(s)	20		