



COURSE SYLLABUS

« BIOPHYSICS »

Degree of higher education - Master's

Specialization 211 «Veterinary Medicine»

Educational programme « 211 «Veterinary Medicine» »

Academic year 2023/2024, semester 1

Form of study full-time (full-time, part-time)

Number of ECTS credits 4

Language of instruction English (Ukrainian, English, German)

Lecturer of the course

candidate of physical and mathematical sciences, associate professor Oksana Godlevska

Contact information of the lecturer (e-mail)

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Course page on eLearn

<https://elearn.nubip.edu.ua/course/view.php?id=3634>

COURSE DESCRIPTION

The main objective of the course “Biophysics” is to expose principal laws and theses of physics which make it possible to study general regularities of natural phenomena; to apply the principles and methods of the physical sciences to biological problems; to consider the biophysical problems which are concerned with the viability of agricultural animals and their interaction with the environment; to elucidate possible application of physical instrumentation to veterinary practice.

The main requirements to the student after studying by him the course “Biophysics” are the following:

The student must know

the main physical quantities and units, principal laws and theses of general physics, theory and practice of measurement errors;

general physical processes and phenomena which take place in the living organism;

the effects of external physical factors on agricultural animals and their interaction with the environment;

possibility of the application of physical instrumentation to veterinary practice.

The student must be able

to process experimental data and estimate measurement errors;

to explain physical principles and mechanisms of function of living organism;

to use modern physical methods and devices in veterinary practice.

Final control is carried out in the form of tests for each of the modules and an exam.

Acquisition of competencies

The study of the academic discipline "Biophysics" contributes to the fact that, according to this standard, the student is able to acquire:

general competencies (GC):

GC01. Ability to abstract thinking, analysis and synthesis.

GC02. Ability to apply knowledge in practical situations.

GC08. Ability to learn and master modern knowledge.

professional (special) competences (SC):

SC1. The ability to establish the features of the structure and functioning of cells, tissues, organs, their systems and body apparatuses of animals of various classes and species - mammals, birds, insects (bees), fish and other vertebrates.

SC2. The ability to use tools, special devices, devices, laboratory equipment and other technical means to carry out the necessary manipulations during professional activity.

SC7. Ability to organize and conduct laboratory and special diagnostic studies and analyze their results.

SC18. Ability to use specialized software tools to perform professional tasks.

Program learning outcomes (PLO):

PLO1. Know and correctly use the terminology of veterinary medicine.

PLO2. Use information from domestic and foreign sources to develop diagnostic, treatment and business strategies.

PLO3. To determine the essence of physico-chemical and biological processes that occur in the body of animals in normal and pathological conditions.

COURSE STRUCTURE

-full-time education.

Names of content modules and topics	Number of hours											
	Full-time form							Part-time form				
	weeks	total	including					total	including			
			l	p	lab	individual	self		l	p	lab	individual
1	2	3	4	5	6	7	8	9	10	11	12	13
Content module 1. Mechanics. Acoustics. Thermodynamics.												
Topic 1. Mechanics. Kinematics, dynamics, statics. Elastic properties of bodies.	1-2	14	2		4		8					
Topic 2. Biomechanics	2-3	8	2		2		4					
Topic 3. Hydrodynamics.	3-4	8	2		2		4					
Topic 4. Basics of hemodynamics.	4-5	8	2		2		4					
Topic 5. Acoustics, bioacoustics.	5-7	16	4		4		8					

ASSESSMENT POLICY

Policy regarding deadlines and resits:	Assignments submitted after the deadline without valid reasons will be graded lower. Resitting of modules will be allowed with the permission from the lecturer and in the presence of valid reasons (e.g. medical reasons).
Academic honesty policy:	Cheating during tests and exams is strictly prohibited (including the use of mobile devices). Coursework and research papers must contain correct citations for all sources used.
Attendance policy:	Class attendance is mandatory. In case of objective reasons (such as illness or international internships), individual learning may be allowed (in online format by the approval of the dean of the faculty).

SCALE OF ASSESSMENT OF STUDENT KNOWLEDGE

Student rating, points	National grade based on exam results	
	exams	credits
90-100	excellent	passed
74-89	good	
60-73	satisfactory	
0-59	unsatisfactory	not passed

Recommended sources of information

Posudin Yuriy. *Physics with Fundamentals of Biophysic.*- 2d edition.- Kyiv: Printline, 2014.- 209 p.

Physics\ V. Boyko, O. Godlevska, P.Iiin, M. Malyuta\ Methodical recommendations for the students, who attend the English-speaking lectures, printed NULE of Ukraine, Kyiv. 2021, p.52

Посудін Ю.І. *Лабораторний практикум з дисципліни «Фізика з основами біофізики» для студентів, що слухають лекції англійською мовою.* К.: 2010.-194 с. (для англійськомовних груп).
Бойко В.В., Відьмаченко А.П., Залоїло І.А., Малюта М.В. *Фізика з основами кваліметрії: Навчальний посібник.* - К.: Видавництво «Ліра– К», 2018, – 564 с.

Практикум з біофізики : навчальний посібник для вищих навчальних закладів. Ч. I. Біомеханіка / В. В. Бойко, І. А. Залоїло, О. О. Годлевська. - К.: , 2021. - 572 с.

Практикум з біофізики : навчальний посібник для вищих навчальних закладів. Ч. II. Біотермодинаміка. Біоелектрика та біомагнетизм. Фотобіологія. / В. В. Бойко, І. А. Залоїло, Ю.І. Посудін. - К.:, 2019. - 486 с.

Посудін Ю.І. *Фізика з основами біофізики.* Київ, Світ, 2003.-400 с.

Посудін Ю.І. *Лабораторний практикум з дисципліни "Фізика з основами біофізики": Навчальний посібник* - Київ, НУБіПУ, 2012.-105 с.