



**MINISTRY OF EDUCATION AND SCIENCE OF
UKRAINE
STATE BIOTECHNOLOGICAL UNIVERSITY**
Faculty of Veterinary Medicine

APPROVED by
Head of the Department of Animal
Physiology and Biochemistry

 (Denysova O.M.)
(signature) (surname and initials)
" 30 " June 2025

Department of "Animal Physiology and Biochemistry"
(name of department)

WORK PROGRAM
ACADEMIC DISCIPLINE
OK "Physiology Of Animals"
(code and name of the academic discipline)

Level of higher
education

The second level of higher education (master's)

(name)

Branch of knowledge

21 Veterinary medicine

(code and name)

Specialty

211 Veterinary medicine

(code and name)

Educational program

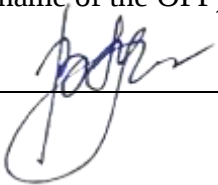
Veterinary medicine

Compiled by: Doctor veterinary sciences, Professor Bobrytska O.M., Candidate of Biological Sciences, Associate Professor Vodop'yanova L.A.

The working program of the academic discipline was approved at an extended meeting of the Department of "Animal Physiology and Biochemistry"

Minutes dated: " June 30 " , 2025 No. 2 0 .

Educational program guarantor Veterinary medicine
(name of the OPP)

"30" of June 2025 year ( Naumenko S.V.

The validity period has been extended to:

" " 20 protocol N from " 20

head of department (name of department) _____ (signature) (_____)
(last name and initials)

" " 20 protocol N from " 20

head of department (name of department) _____ (signature) (_____)
(last name and initials)

" " 20 protocol N from " 20

head of department (name of department) _____ (signature) (_____)
(last name and initials)

1 Description of the academic discipline

Name of indicators	Characteristics of the academic discipline			
	full-time education		correspondence form of education	
Number of credits	Discipline status:			
7 ECTS credits	mandatory			
Sections - 4	Year of training:			
	1st	2nd	—	—
	Semester			
The total amount is <u>210</u> hours	2nd	3rd	—	—
	Lectures			
	<u>20</u> hours	<u>14</u> hours	-	-
	Practical, (seminar)			
	-	-	-	-
	Laboratory			
	<u>38</u> hours	<u>44</u> hours	-	-
	Independent work			
	<u>62</u> hours	<u>32</u> hours	-	-
Weekly hours for full-time training: classroom – <u>116</u> ; independent work acquirer – <u>94</u>	Type of control:			
	credit	exam	—	—

2 Purpose and objectives of the discipline

The method of the course "Animal Physiology" is to provide students with sound theoretical and practical knowledge of the course of physiological processes in the body of animals of various species and to teach them methods of managing physiological functions to increase productivity and improve the quality of livestock products.

The objectives of studying the discipline are to master the basic methodological techniques for researching functional systems of causes, analyzing the obtained experimental results, and considering their use in theory and practice.

The subject of study of the academic discipline is an in-depth study of biological processes in the animal body and its components (cells, subcellular structures, tissues, organs and organ systems) in their unity and interconnection with the environment.

The bases for successful mastering of the discipline are the program material of the discipline (*from the structural and logical scheme of the educational program for mandatory disciplines*) "Animal Biochemistry", "Animal Anatomy", "Histology".

This academic discipline ensures the formation of such program learning outcomes:

PLO 1. Know and correctly use the terminology of veterinary medicine

PLO 3. Determine the essence of physicochemical and biological processes that occur in the animal body normally and during pathology.

3 Program of the educational discipline

Section 1 Neuromuscular Physiology. Central Nervous System and Higher Nervous Activity

Topic 1 Physiology of recovery processes. Bioelectric phenomena in tissues
Summary of the topic: Physiology is the science of functions in the body. Physiology of recovery processes. Bioelectric phenomena in tissues. Physiological properties of tissues. Stimuli, their classification. Excitation, conditions for its occurrence. Phases of changes in tissue excitability. Lability. Optimum and pessimum of the frequency and strength of irritation. Biocurrents, the history of their discovery. Modern findings about bioelectric phenomena in tissues. Theory of excitation. Distribution of potassium and sodium ions in the cytoplasm and outside the cell. Membrane potential. Mechanisms of the occurrence of the action potential. Potassium-sodium pump.

Recommended reading (references): 1[294-313], 2[25-46], 3[P. 70- 148]

Topic 2 Muscle physiology. Functional significance of nerves

Summary of the topic: Features of the structure of muscle fiber. Physiological properties of muscle tissue: excitability, conductivity, contractility, plasticity, elasticity, automatism. Evolution of the nervous system. Functions of the CNS, its role in the body. Reflex is the main form of CNS activity. Reflex arc and reverse afferentation. Classification of reflexes. Structure and classification of nerve fibers, their physiological properties. Transmission of recovery in nerve fibers. Laws of recovery. Physiology of synapses. Role of mediators.

Recommended reading (references): 1[294-313], 2[25-46], 3[P. 335-384];

1[315-346], 2[177-190], 3[P.111-148], 3[P. 148-166]

Topic 3 Functions of the spinal cord. Autonomic nervous system

Summary of the topic: Spinal cord centers. Main spinal reflexes. Monosynaptic and polysynaptic reflex arcs. Functions of the dorsal and ventral roots of the spinal cord. Conductive pathways of the spinal cord. Autonomic nervous system. Functional significance of the reticular formation of the brainstem, its ascending and descending influence. Its participation in the phenomena of sleep and wakefulness, the formation of emotions and motivation. Structural and functional features of the autonomic nervous system. Mechanisms of excitation transmission in the ganglia and in the area postganglionic Conclusion. Higher centers of the autonomic nervous system and its influence on the functions of various organs.

Recommended reading (references): 1[315-346], 2[177-190], 3[P. 166-206]

Topic 4 Brain Functions

Summary of the topic: Nerve centers. Centers and pathways of the medulla oblongata. The role of the bulbar part of the brain in the regulation of hemodynamic , respiratory and food reflexes. The function of the quadrilateral corpus callosum. Red nucleus and Deiters' nucleus . Decerebration rigidity . Static and stato -kinetic reflexes. Thalamus, its functions. Hypothalamus, as a regulator of homeostatic functions, the department of the formation of emotions and motivations. Subcortical formations, their role in the regulation and integration of motor, sensory and vegetative functions. Structure and functions of the limbic system. Reticular formatting.

Recommended reading (link): 1[315-346], 2[177-190], 3 [S. 174-183], 3[S. 148-166]

Topic 5 Higher nervous activity and conditioned reflexes

Summary of the topic: Functional structural features different areas of the cortex main mine. Conditioned reflexes, conditions and mechanism of their formation. Types of conditioned reflexes, their biological value.

Recommended reading (references) : 1[346-374], 2[177-190],3[183- 206]

Section 2 Physiology of the circulatory system. Physiology of the respiratory system

Topic 6 Physiology of the Heart

Summary of the topic: Cardiac cycle and its phases. Dynamics of blood movement in the heart cavities, the role of valves. Phenomena that accompany the work of the heart. Indicators of cardiac activity. Properties of the myocardium. Automaticity of the cardiac muscle.

Recommended reading (references): 1[47-73], 2[65-84], 3[P. 400-457]

Topic 7 Physiology of the heart (regulation)

Summary of the topic: Nervous regulation of the heart. Humoral regulation of the heart. Physiological foundations of hemodynamics.. Patterns of blood movement through the vessels. Speed of movement. Blood pressure and factors that determine it. Arterial pulse. Features of blood circulation in various organs. Vascular-motor center. Vascular tone and its regulation. Reflexogenic vascular zones. Depot blood.

Recommended reading (references): 1[47-73], 2[65-84], 3[P. 400-457]

Topic 8 Respiratory Physiology

Summary of the topic: The essence of the breathing process. The mechanism of inhalation and exhalation. Lung ventilation. The importance of the upper respiratory tract. Types of breathing. Gas exchange in the lungs and tissues. The mechanism of oxygen and carbon dioxide transport. Oxygen capacity of the blood. Regulation of breathing.

Recommended reading (references) : 1[74-89], 2[86-95], 3[P. 493- 553]

Section 3 Physiology of the Blood System

Topic 9 Composition, properties and functions of blood. Blood groups

Summary of the topic: Physiological properties of blood. Blood groups in animals and methods for their determination. Study of the properties of erythrocytes. Osmotic properties of erythrocytes

Recommended reading (references): 1[pp.25-45], 2[pp.7-15], 3[pp. 25-69], 3[pp. 385-492].

Topic 10 Formed blood elements. Hemostasis. Hemoglobin. Hematopoiesis

Summary of the topic : Properties of hemoglobin and methods for its determination. Determination of the number of erythrocytes and leukocytes. Leukocyte formula and its research. Hematopoiesis.

Recommended reading (references): 1[p.25-45], 2[p.49-63], 3[p. 612- 653]

Section 4 System Physiology digestion. Metabolism of substances and energy. Thermoregulation and excretion

Topic 11 Digestion in the oral cavity. Digestion in a single-chamber stomach

Short contents Topics : The essence of digestion and its types. Main functions of the digestive system tract. Enzymes. Digestion in oral internal. Composition, properties and significance of saliva. Regulation salivation. The act of swallowing. Definition and functions of the stomach. Characteristics of the gastric glands, their localization. Phases gastric juice secretion and its mechanism.

Composition and properties of gastric juice. The role of hydrochloric acid in digestion. Enzymes of gastric juice. Motor function of the stomach and its regulation.

Recommended reading (references) 1[p.91-107], 2[p.107-127], 3[p. 654-670.]

Topic 12 Features of digestion in the stomach of ruminants

Summary of the topic: Development of the foregut. Digestion in the lactation and transitional periods. The esophageal reflex and its significance.

The ruminant process. The importance of the foregut in May processes. The role of microflora and microfauna in cicatricial digestion. Auricular motility and its regulation. Digestion in the abomasum . Transformation of nutrients and nitrogenous compounds in the rumen. Rumen-hepatic nitrogen circulation. Physiological justification for including yellow non-protein nitrogen sources in the diet.

Recommended reading (references): 1[p.107-116], 2[p.107-127], 3[p.670-682.]

Topic 13 Digestive processes in the intestines

Summary of the topic: Digestive processes in the small intestine. The pancreas and methods for studying its secretion. Composition and properties of pancreatic juice. Composition and properties of bile. Formation of bile and its removal. Methods for studying the secretion of intestinal juice. Parietal digestion. Digestion in the large intestine.

Recommended reading (references): 1[p.16-138], 2[p.107-127], 3[p.682-690]

Topic 14 Metabolism

Summary of the topic : The essence, stages and types of metabolism. Nitrogen metabolism. Biological value of proteins and physiological significance of individual amino acids. Protein renewal in the body. Nitrogen balance. Protein minimum. Features of nitrogen metabolism in ruminants. Regulation of nitrogen metabolism. Biological role of carbohydrates and lipids. Conversion of carbohydrates in tissues of harmful substances. Regulation of blood sugar levels. Features of carbohydrate metabolism in ruminants. Conversion of lipids in tissues of harmful substances. Regulation of lipid metabolism. Relationship between the metabolism of proteins, carbohydrates and fats. Energy conversion in the body. Regulation of energy metabolism. Thermoregulation.

Recommended reading (references): 1[p.1396-169], 2[p.129-142], 3[p.701-705]

Topic 15 Physiology of excretory organs

Summary of the topic: Excretory organs. Excretory function of the skin. Excretory function of the digestive tract and lungs. Functions of the kidneys. Nephron as a functional unit of the kidneys. Features of blood circulation in the kidneys. The main processes occurring in the kidneys: ultrafiltration, reabsorption, secretion. Mechanism urine formation. The role of the kidneys in maintaining osmotic homeostasis. Nervous and humoral regulation of kidney activity. Quantity, composition and properties of urine. Function of the urinary bladder, mechanism urination.

Recommended reading (references): 1[p. 188-198], 2[p. 143-146], 3[p. 557-611]

Section 5 Physiology of endocrine glands. Physiology of lactation. Physiology of analyzers

Topic 16 Physiology of endocrine glands.

Summary of the topic: Hormones and their biological role. General properties of hormones. Chemical nature hormones. Mechanism of action of hormones. Organs of the endocrine system. Hypothalamus. Pituitary gland, pineal gland. Thyroid gland. Parathyroid gland.

Recommended reading (references): 1[p.204-249], 2[p. 148-155], 3[p.268-330.], 1[p.274-293], 2[p.167-175], 3[p. 757-805.]

Topic 17 Lactation . Physiology of analyzers

Summary of the topic: Growth and development of the mammary glands, regulation of this process. Parenchyma and the capacious system of the udder . Milk and its composition in different animal species. Colostrum and its biological role. Milk formation. Regulation of lactogenesis and lactopoiesis . Distribution of milk in

the process of its formation. Factors affecting milk formation. Mechanisms of milk excretion: cisternal , alveolar, residual. General properties of receptors. Cutaneous analyzer. Taste analyzer. Olfactory analyzer. Visual analyzer. Organ of hearing and balance.

Recommended reading (references): 1[p.376-377], 2[p.214-223], 3[p.208-267.]

4 STRUCTURE OF THE ACADEMIC DISCIPLINE

Title of sections and topics	Number of hours					
	daytime uniform					
	Total volume	classroom			Independent work	
		total	including			
		lectures	laboratory	practical		
1	2	3	4	5	6	7
Section 1 Neuromuscular physiology. Central nervous system and higher nervous activity						
Topic 1 Physiology of recovery processes. Bioelectric phenomena in tissues	10	10	2	8		
Topic 2 Muscle physiology. Functional significance of nerves	10	10	2	8		
Topic 3 Functions of the spinal cord. Autonomic nervous system	15	10	2	8		5
Topic 4 Brain Functions	15	10	2	8		5
Topic 5 Higher nervous activity and conditioned reflexes.	10	10	2	8		
Total under section 1	60	50	10	40		10
Section 2 Physiology of the circulatory system. Physiology of the respiratory system						
Topic 6-7 Physiology of the Heart	28	8	4	4		20
Topic 8 Respiratory Physiology	32	4	2	2		28
Together under section 2	60	12	6	6		48
Total for the 3rd semester	120	62	16	46		58
Section 3 Physiology of the Blood System						
Topic 9. Composition, properties and functions of blood. Blood groups	18	12	2	10		6

Topic 10. Formed blood elements. Hemostasis. Hemoglobin. Hematopoiesis	12	12	2	10		
<i>Together under section 3</i>	30	24	4	20		6
Section 4 Physiology of the digestive system. Metabolism and energy. Thermoregulation and excretion						
Topic 11. Digestion in the oral cavity and in the single-chamber stomach	6	6	2	4		
Topic 12. Features of digestion in the rumen of ruminants	4	4	2	2		
Topic 13 Digestive processes in the intestines	6	6	2	4		
Topic 14 Metabolism. Thermoregulation	6	6	2	4		
Topic 15 Physiology of excretory organs	38	6	2	4		32
<i>Together under section 4</i>	60	28	10	18		32
Section 5 Physiology of endocrine glands. Physiology of lactation. Physiology of analyzers						
Topic 16 Physiology of endocrine glands	36	28	2	26		8
Topic 17 Lactation. Physiology of analyzers	24	14	2	12		10
<i>Together under section 5</i>	60	42	4	38		18
<i>Total for the 4th semester</i>	150	94	18	76		56
Total hours	270	156	34	122		114

5 Lecture classes

N	Name of the lesson topic	Number of hours
		d/f
Section 1 Neuromuscular physiology. Central nervous system and higher nervous activity		
1	Physiology of recovery processes. Bioelectric phenomena in tissues	2
2	Muscle physiology. Functional significance of nerves	2
3	Functions of the spinal cord. Autonomic nervous system	2
4	Brain functions	2
5	Higher nervous activity and conditioned reflexes.	2
Section 2 Physiology of the circulatory system. Physiology of the respiratory system		
6	Physiology of the heart	2
7	Heart physiology (regulation)	2

8	Respiratory physiology	2
Section 3 Physiology of the Blood System		
9	Composition, properties and functions of blood. Blood groups	2
10	Formed blood elements. Hemostasis. Hemoglobin. Hematopoiesis	2
Section 4 Physiology of the digestive system. Metabolism and energy. Thermoregulation and excretion		
11	Digestion in the oral cavity and in the single-chamber stomach	2
12	Features of digestion in the rumen of ruminants	2
13	Digestive processes in the intestines	2
14	Metabolism. Thermoregulation	2
15	Physiology of excretory organs	2
Section 5 Physiology of endocrine glands. Physiology of lactation. Physiology of analyzers		
16	Physiology of endocrine glands	2
17	lactation. Physiology of analyzers	2
	Together	34

6 Laboratory classes

N	Name of the lesson topic	Number of hours
		d/f
Section 1 Neuromuscular physiology. Central nervous system and higher nervous activity		
1	Methods of physiological research	2
2	Physiology of recovery processes	2
3	Tissue biocurrents	2
4	Physical properties of muscles	2
5	Strength, fatigue, work muscles	2
6	General principles of CNS construction	2
7	Property of a nerve fiber	2
8	Features of nerve fiber recovery	2
9	Functions of the spinal cord	2
10	Properties of nerve centers	2
11	Autonomic nervous system	2
12	Functions of individual parts of the brain (brain stem)	2
13	Functions of individual parts of the brain (midbrain)	2
14	Reticular formation	2
15	Functions of individual parts of the brain (dietary brain)	2
16	Study of brain reflexes	2

17	Functions of the cerebral cortex.	2
18	Higher nervous activity	2
19	Types of higher nervous activity, inhibition	2
20	Chapter 1 Test	2
Chapter 2 Physiology of the circulatory system. Physiology of the respiratory system		
21	Methods of studying the heart. Analysis of the cardiac cycle	2
22	Properties of the heart muscle. Regulation of heart activity. Hemodynamics	2
23	Mechanism of breathing. Regulation of breathing. Test of section 2	2
Section 3 Physiology of the Blood System		
24	Blood physiology.	2
25	Blood types	2
26	Study of the properties of erythrocytes	2
27	Osmotic properties of cells	2
28	Property of hemoglobin	2
29	Determination of the number of red blood cells	2
30	Definition of some leukocytes.	2
31	Leukocyte formula	2
32	Hematopoiesis	2
33	Section 3 Test	2
Section 4 Physiology of the digestive system. Metabolism and energy. Thermoregulation and excretion		
34	Digestion in the oral cavity	2
35	Digestion in the stomach of monogastric animals.	2
36	Digestion in the rumen	2
37	Composition and properties of pancreatic juice and bile.	2
38	Composition and properties of intestinal juice. Parietal digestion	2
39	Methods of studying metabolism. Metabolism of proteins, carbohydrates and lipids	2
40	Research into energy processes and thermoregulation	2
41	Functions of excretory organs	2
42	Study of the processes of allocation	2
43	Section 4 Test	2
Section 5 Physiology of endocrine glands. Physiology of lactation. Physiology of analyzers		
44	General endocrinology.	2
45	Hormones	2
46	Hypothalamus, pituitary gland, pineal gland	2
47	Thyroid gland	2
48	Parathyroid glands	2
49	Endocrine function of the pancreas and adrenal glands	2

50	Endocrine function of the adrenal glands	2
51	Endocrine function of the cardiac glands	2
52	Principles of endocrine regulation	2
53	Mammogenesis	2
54	Lactation	2
55	Composition of milk and colostrum.	2
56	Regulation of milk production and secretion	2
57	Physiology of analyzers	2
58	Taste analyzer	2
59	Visual analyzer	2
60	The organ of hearing and balance.	2
61	Section 5 test	2
Total		122

7 Independent work

N	Topic name	Number of hours
		d/f
Section 1 Neuromuscular physiology. Central nervous system and higher nervous activity		
1	General characteristics of different types of animal behavior (innate or innate)	5
2	Zoopsychology and mental processes in animals	5
Section 2 Physiology of the circulatory system. Physiology of the respiratory system		
3	Features of the CVS in different animal species	10
4	Features of breathing in birds	16
Section 3 Physiology of the Blood System		
5	Blood groups in animals	6
Section 4 Physiology of the digestive system. Metabolism and energy. Thermoregulation and excretion		
6	Features of excretion in different animal species	22
7	Prostaglandins	10
8	Hormones of the kidneys and digestive system.	30
Section 5 Physiology of endocrine glands. Physiology of lactation. Physiology of analyzers		
9	Differences in analyzers in animals of different species	10
	Total	114

8 Methods teaching

(According to the structure of the academic discipline)

1. Lecture classes are an oral presentation of educational material that is large in volume and complex in logic. construction.
2. Laboratory classes are a form of educational activity in which a student, under the guidance of a teacher, freely conducts experiments to provide practical confirmation of individual theoretical provisions of the educational program. disciplines.
3. Independent concepts are a form of organizing the educational process in which the planned tasks are completed by the student under the methodological guidance of the teacher, but without his/her sum. participation.

9. Control methods

- ❖ oral interview;
- ❖ test control;
- ❖ credit;
- ❖ exam

During the current and final control of the assessment of learning outcomes in the discipline, there are standardized computer tests.

The final semester control (credit) is carried out based on the sum of the actually scored rating points from the current control and the individual educational and research task.

The current period during the semester by means of a survey (oral or test), as well as checking the quality of the independent work test.

When selecting the criteria for assessing the student's mastery of the discipline program, the program implementation and preparation of material in terms of lecture and laboratory tasks, as well as the performance of independent work provided for by the program, were taken into account.

All types of control (oral questioning, written questioning, test questioning) are closely related and organized in such a way as to stimulate effective independent work of applicants and ensure an objective assessment of the level of their knowledge.

After completing the study of the discipline (part of the discipline), the final test result in the test group and the applicant can score from 60 to 100 points inclusive at the control points during the semester.

10. Distribution of points obtained by applicants (credit)

During the course, the success of applicants is monitored through ongoing and final control (credit and exam).

Current testing, answers to tasks and control of independent work					Total points
Chapter 1	Chapter 2	Chapter 3	Chapter 4	Chapter 5	

T 1-5	T6-8	T9-10	T11-15	T16-17	60-100
0-100	0-100	0-100	0-100	0-100	

T 1, T 2... T 17 –topics of sections.

The grade that a higher education applicant receives for conducting an intermediate (current) control (CurC) consists of the points that the applicant receives during testing (T), which are 30%; the points that the applicant receives during activity in classes (Cl), which are 40%; and the points for mastering the independent work block (InW), which are 30%.

$$\text{CurC} = T \times 0,3 + Cl \times 0,4 + InW \times 0,3$$

In each section of the educational component, current control is carried out (**current control** - CurC).

For applicants in the fall (spring) semester, when the final knowledge test is completed with an undifferentiated credit (UDC), the final sum of points (UDC points) is the arithmetic average of the points of the four current tests of the fall (spring) semester:

$$\text{UDC points} = (\text{CurC } 1 + \text{CurC } 2) / 2$$

Based on the results of the semester control, the applicant is given a "pass/fail" grade on the national scale in his/her transcript.

11. Distribution of points obtained by applicants (exam)

Ongoing testing and independent work					Total points	
Section 1	Section 2	Section 3	Section 4	Section 5	According to the results of the sections (R)	Exam (E)
T1-5	T6-8	T9-10	T11-15	T16-17		
0-100	0-100	0-100	0-100	0-100	((T ₁ + T ₂ + ... T ₁₇) / n) x 60%	Ex 40%
Overall rating score (ORS = R+E)					60-100	

T₁, T₂... T₁₇ – topics of Sections,
n – number of topics.

The final control of the academic performance of applicants is carried out in the form of an exam based on the results of computer testing. The exam grade for the educational component (discipline) is determined on a 100-point scale.

The exam grade (EG) is 40% of the total final grade (FG).

$$\text{EG} = \text{ETS} \times 0,4$$

where: EG – exam grade; ETS– exam testing scores, which account for 40% of the points scored during exam testing.

The final grade for the discipline is given on a 100-point scale. It is calculated as the average arithmetic value (AAV) of all the grades received by the student from the

current control (CurC) of the assimilation of the material of the sections, with their subsequent conversion into points according to the following formula:

$$AAV = (\text{CurC Section1} + \text{CurC Section2} + \text{CurC Section3} + \text{CurC Section4} + \text{CurC Section5}) / 5$$

$$\text{CurCS} = AAV \times 0,6$$

where: CurCS – current control scores, which make up 60% of the total final score; AAV is the arithmetic average value of all grades received by the student from the current control

The applicant can score up to 60 points inclusive at the control points of the mastery of the sections within 2 semesters.

Thus, the final grade (FG) is calculated using the formula:

$$FG = EG + \text{CurCS}$$

The results of the tests are displayed in the DBTU Moodle system. All forms of control are included in the 100-point assessment scale.

12. Scale: national and ECTS and criteria assessment to determine the level of knowledge and skills

The control of students' knowledge and skills in the discipline is carried out based on the use of the transfer system and the accumulation of European ECTS credits.

Main provisions:

The total number of current tests that a student must pass in a discipline is based on the number of credits in the discipline.

Based on the results of the current control event, the student's level of mastery of the educational material is assessed according to the national scale and the *ECTS scale*.

The number of points received by the student in the final assessment corresponds to the grades on the national scale and the **ECTS scale** in accordance with Table 1.

1. Rating scale

<i>100-point scale</i>	National scale	Definition	ECTS scale
90 – 100	excellent	Excellent - excellent answer, the work is fulfilled with only a small number of errors	A
82 – 89	good	Very well - above average with a few errors	B
74 – 81		Well - in general the correct answer, the work with a certain number of serious errors	C
64 – 73	satisfactory	Satisfactorily – not bad, but with big number of errors	D
60 – 63		Quite satisfactorily – the work meets the minimum criteria	E
35–59	unsatisfactory	Unsatisfactorily – with the possibility to pass again	FX

0-34		Unsatisfactorily – with compulsory passing of the work once again	F
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Passing the current tests is mandatory. The section is assessed as passed if the student scores the minimum required number of points or more.

The results of the rating from the section are provided to students no later than the third working day after the control event and, in the event of any complaints from students, are considered final.

If a student disagrees with the decision to assign him rating points for a section, he must immediately after their announcement send a written application to the head of the department and within the specified period take an oral certification of the section before the commission. The composition of the appeal commission in each specific case is determined by the head of the department. The decision of the commission is final.

A student who did not appear for the current examination has the right to take the missed current examination during the assessment week.

The final rating of the current performance in the discipline is calculated in the middle of the ratings from all sections. The semester grade is given to the student taking into account the results of the final and current control. The maximum number of points that a student can receive when studying the discipline is 100.

The exam involves a final test. If permission is granted for automatic crediting of the test, a student who has temporarily passed all current tests and has been certified with an "excellent" grade based on their results may receive a credit automatically. The semester grade in this case is the average grade for the sections.

The teacher is obliged to submit the completed assessment and examination report to the academic department within the following deadline: for the exam - no later than the next working day after its completion.

The mastery of the independent work block was assessed on a scale in accordance with the following regulations (Table 2)

Table 2.

Independent work assessment SCALE

Evaluation criteria (100-point system, oral interview).

No.	Criteria	Maximum number of points	Description
1	Full answer	30 points	The answer covers all the main aspects of the question, revealing its content in accordance with the curriculum.
2	Correctness and accuracy of presentation	20 points	The answer contains no factual, logical, or terminological errors.
3	Consistency and logic	10 points	The answer is logically structured, without incoherent or chaotic fragments.

4	Language and style of presentation	10 points	The expression is competent, clear, using professional terminology.
5	Independence of thinking	10 points	The student demonstrates the ability to draw their own conclusions, analyze, compare, and give examples.
6	Additional knowledge (according to the main program)	10 points	The answer contains links to modern sources, interdisciplinary connections, and the latest data.
7	Ability to answer additional questions	10 points	The student confidently responds to the teacher's clarifying or probing questions, providing additional arguments or examples.

For conversion of grades on a 100-point scale to the national scale and ECTS scale, see the table:

Total points for all types of learning activities	Rating ECTS	National scale assessment
90 – 100	A	perfectly
82 – 89	B	good
74 – 81	C	
64 – 73	D	satisfactory
60 – 63	E	
35 – 59	FX	unsatisfactory with the possibility of reassembly
0 – 34	F	unsatisfactory with mandatory re-study of the discipline

Activity on concepts was assessed on a scale with a maximum of 100 points in accordance with the following regulations (Table 3)

Table 3.

SCALE in classes

ECTS scale	National scale	Points	Decoding the scores
A	Excellent	90-100	The student actively works in the course of the course, gives complete answers to the teacher's questions and shows a deep mastery of the material, is able to express his own opinion when discussing situational tasks, shows the ability to independently and

			reasonably present the material, analyze the identified facts, make independent generalizations and conclusions, correctly complete the educational tasks, has a full synopsis of the theoretical material. regular visit to the Moodle system
B	good	82-89	the student is actively working during the lessons, the questions are fully covered, the presentation of the material is logical, substantiated by facts, with references to literary sources, the coverage of questions with completed conclusions, the students' ability to analyze facts and events, as well as to complete educational tasks. But the answers contain inaccuracies, some minor errors, the presence of a full summary of the theoretical material, regular visit to the Moodle system
C	good	74-81	The student is actively working during the lessons, the questions are fully covered, the presentation of the material is logical, substantiated by facts, with references to literary sources, the coverage of questions with complete conclusions, the students have the ability to analyze facts and events, as well as perform educational tasks. However, there are inaccuracies in the answers, some minor errors, there is insufficient reasoning when presenting the material, there is an incomplete synopsis of the theoretical material, partial access to the Moodle system
D	satisfactorily	64-73	The student in all areas covers issues on the topic, demonstrates knowledge of lecture material and educational literature, tries to analyze facts and events, draw conclusions and solve situational problems. But in class, he behaves passively, responds only to the teacher's call, gives incomplete answers to questions, makes gross errors in covering theoretical material, incomplete notes on theoretical material, partial access to the Moodle system.
E	satisfactorily	60-63	the student lacks understanding of the main essence of the question, conclusions,

			generalizations, demonstrated inability to solve situational problems, incomplete note-taking of theoretical material, partial access to the Moodle system.
FX, F	dissatisfied	0-59	lack of desire to participate in the issues discussed, lack of notes, irregular visits to the Moodle system

Example: a student wrote the test tasks of the current control for 85 points. Multiply by 0.3. The result for the test is 25.5 points. For independent work, the student received 88 points. Multiply by 0.3. The result for it is 26.4 points. For activity on concepts - the student received 74 points. Multiply by 0.4. We get 29.6. The total number of points for the current control is 81.5 points. We average towards a larger number and get 82 points, which is equal to good B.

Regarding the student's final assessment, the results obtained for the student's current work (average grade for 5 sections, multiplied by 0.6) and the final test (multiplied by 0.4) need to be taken into account.

Example: Section I – 83 points, Section II – 95 points, Section III – 73 points, Section IV – 88 points, Section V – 88 points. The sum of the points for the section is $427 / 5 = 84.5$ (85) points – this is the average value. Next, $85 \times 0.6 = 51$ points. The student wrote the final exam with 91 points. $91 \times 0.4 = 36.4$ points. Therefore, the total number of points for the discipline is $51.0 + 36.4 = 87.4$. We average towards a smaller number and get 87 points, which is equal to a good or B grade.

13 Methodical software

1. Normal physiology of animals: Test's book / Vodopyanova L., Bobritska O. – Kharkiv: KSZA, 2021. – 108 p.
2. Normal physiology of animals: Lectures. Textbook for the self-study of students/ Vodopyanova L., Bobritska O. – Kharkiv: KSZA, 2021. – 116 p.
3. Normal physiology of animals: Practical. Textbook for the self-study of students B 63/ Vodopyanova L., Bobritska O., Ugai K., Ieliseienko A. – Kharkiv: 2019. – 210 p.

14 Recommended literature

1. Animal Physiology, From Genes to Organisms, Sherwood, Lauralee; Klandorf, Hillar; Yancey, 2013, Second edition/ Publisher: Cengage Learning, 896p.

Additional

2. Physiology practical / S.Borbély, L. Détári, T. Hajnik, K. Schlett. – Department of Physiology and Neurobiology: Eötvös Loránd University, 2013. – 215 p.
3. Normal physiology of animals: Textbook for the self-study of students/ Vodopyanova L., Bobritska O. – Kharkiv: KSZA, 2020. – 116 p.

15 Electronic information resource

(Link)

1. Physiology with animals , Animal physiology – www.youtube.com/@animalsphysiology
2. <http://moodle.btu.kharkiv.ua/course/view.php?id=464>

16 Changes and addition

(to methodological support and recommended literature)

What is removed from the work program	What is entered in the work program	Date of review department