Ministry of Education and Science of Ukraine
Sumy National Agrarian University
Faculty of Veterinary Medicine
Department of Internal Medicine, Pharmacy and Biochemistry

Work program (syllabus) of the educational component

Animal Physiology

(Mandatory)

Specialty	H6 Veterinary medicine
Educational program	Veterinary medicine
Level of higher education	Second (Master's)

Sumy-2025

Author: _____ (Kalashnyk O.M., Phd, Associate professor of department of Internal Medicine, Pharmacy and Biochemistry)

Module syllabus agreed at the _____ Department meeting	Minutes No 17 dated 09.06.2025
	Head of the Department of Internal Medicine, Pharmacy and Biochemistry _____ (Nechiporenko O.L.)

Approved by:

Guarantor of the educational program _____ .
(signature) (full name)

Dean of the faculty where the educational program is implemented _____ Nagorna L.V.
(signature) (full name)

A review of the work program (attached) was provided by:
Doctor of Veterinary Sciences, Professor Shkromada O.I.
PhD, Associate Professor Plyuta L.V.

Methodologist of the Education Quality Department,
licensing and accreditation _____ N. Baranik
(signature) (full name)

Registered in the electronic database: date: 01.07. 2025 .

Syllabus review data:

The academic year in which changes are made	The Academic program attachment number with changes description	Changes revised and approved		
		Minutes No and date of the department meeting	Head of Department	Guarantor of the Academic program

1. MODULE OVERVIEW

1.	Title	Animal Physiology			
2.	Faculty/Department	Faculty of Veterinary Medicine, Department of Internal Medicine, Pharmacy and Biochemistry			
3.	Type (compulsory or optional)	compulsory			
4.	Program(s) to which module is attached	211 "Veterinary Medicine"			
6.	Level of the National Qualifications Framework	7-th			
7.	Semester and duration of module	3,4			
8.	ECTS credits number	9 ECTS			
9.	Total workload and time allotment	Directed study			Self-directed study
		Lectures	Practicals	Labs	
		2 2	2 2	-	176 116
10.	Language of instruction	English			
11.	Module leader	Kalashnyk O.M., Phd, Associate professor of department of Internal Medicine, Pharmacy and Biochemistry, Phd			
12.	Module leader contact information	kalashnikan@ukr.net			
13.	Module description	The educational program on the physiology of farm animals is part of the educational chain related to the general objectives of training highly qualified veterinarians. Provides mastering of vital processes of an organism, prepares students for mastering of EP from clinical, surgical and epizootological disciplines by studying physiology of all systems of an organism, formation of functional systems and existence of an organism as a whole. Assimilation of material from this EP forms the basis of physiological knowledge of the student and the future veterinarian, contributes to the personal and professional development of the student.			
14.	Module aim	The purpose of the educational component on the physiology of farm animals is to teach students the homeostasis of the animal body, the formation of functional systems and the existence of the organism in the environment. It is a component of the learning process that ensures the achievement of goals, competencies and significant results in the learning process.			
15.	Module Dependencies (prerequisites, co-requisites, incompatible modules)	1. The educational component is based on the studied OK in anatomy, morphology, cytology 2. The educational component is the basis for the study of therapy, pathological anatomy and physiology, surgery, obstetrics, gynecology			
16.	The policy of academic integrity	All tasks related to calculations, planning and accounting documentation will have individual initial data. For violation of academic integrity, students may be held subject to the following academic liability: *Academic plagiarism* - grade 0, re-completion of the task. *Academic fraud* (copying, deception, publishing someone's work for their own) - cancellation of points; re-assessment evaluation re-execution of non-independently performed			

		work with new source data; *The use of electronic devices* during the final control of knowledge - removal from work, grade 0, re-passing the final control.
17	Key word	Physiology, Animals, normal vital indicators

2. CORRELATION BETWEEN MODULE LEARNING OUTCOMES (MLOs) AND PROGRAM LEARNING OUTCOMES (PLOs)

MLOs: On successful completion of the module the learner will be able to:	**PLOs**				**How assessed**
	PLOs 1	PLOs 3	PLOs 4	PLOs 15	
MLOs 1. Competently use the laws of life processes (metabolism, respiration, blood circulation, digestion, excretion, etc.) at different structural levels. Be able to practically apply the acquired knowledge	+				1. Survey in laboratory-practical classes, notebook design 2. Registration of abstracts
MLOs 2. Identify the mechanisms that ensure the interaction of individual systems and organs as a whole with the external environment. Be able to use tools, instruments, devices for research and assessment of animals.				+	1. Survey in laboratory-practical classes, notebook design 2. Registration of abstracts
MLOs 3. To establish qualitative differences of physiological functions in animals in different ecological conditions. Be able to use the acquired knowledge to highlight theoretical and practical problems in production.			+		1. Survey in laboratory-practical classes, notebook design 2. Registration of abstracts
MLOs 4. Formulate the formation of physiological functions, their formation at different stages of individual development. Be able to apply knowledge in practice		+			1. Survey in laboratory-practical classes, notebook design 2. Registration of abstracts
MLOs 5. Carry out the conduct and organization of the elements of the conduct and organization of scientific physiological research. Be able to determine the conditions of physiological existence of animals in the environment				+	1. Survey in laboratory-practical classes, notebook design 2. Computer survey and analysis of students' knowledge (certification) 3. Multiple choice test (test, exam)

3. MODULE INDICATIVE CONTENT

Topics	Distribution of hours				Learning resources
	Directed study			Self-directed study	
	Lecture	Pr	Lab		
3 semestr					
Topic 1. Physiology of excitable tissues.	**2**			**40**	1, 2, 3, 4, 10, 11
1. General methods of physiological research, rules of work with experimental animals, rules of work with devices. Occupational safety and health in the laboratory.				10	
2. Manufacture of neuromuscular drug. The effect of various stimuli on the neuromuscular drug.				20	
3. Investigation of the effect of load and force of the stimulus on muscle function. Dynamometry and muscle fatigue studies. Measurement of reflex time. Spinal reflexes. Determination of receptor fields. Investigate the formation of food conditioned reflexes and defensive conditioned reflexes. Identify the types of GNI of animals	2			10	
Topic 2. Physiology of analyzers				**66**	1, 2, 3, 4, 6, 7, 10
1. Examination of the fundus of the eye of animals (ophthalmoscopy). The reaction of the iris to light. Determining the point of the nearest vision.				36	
2. Definition of color anomalies (color blindness). Blind spot in the eye. Visual illusions.				16	
3. Determination of the spatial threshold of tactile sensitivity (aesthesiometry). Reflexes of clinical significance.				14	
Topic 3. Blood physiology		**2**		**40**	1, 2, 3, 4, 6, 7, 10
1. Study of blood composition and its definition. Research of physicochemical properties of blood.		2		20	
2. Determination of buffering properties of blood. Counting the number of erythrocytes. Study of erythrocyte sedimentation rate. Counting the number of leukocytes. Study of the number of leukocytes. Determination of leukocyte formula. Determination of Hb content in the bloo				10	
6. Hemolysis. Conditions that affect the rate of blood clotting. Determination of blood clotting time.				6	
7. Determination of acid-base balance of blood. Blood buffer systems				4	
Topic 4. Physiology of endocrine glands				**30**	1, 2, 3, 4, 5, 8, 11
Total	**2**	**2**		**176**	
4 semester					
Topic 1. Physiology of digestion	**2**			**20**	1, 2, 3, 4, 5, 8, 9

1. Digestive processes in the foregut. Determination of saliva properties (viscosity, presence of mucin, alkalinity). Auscultation of the stomach and intestines.				10	
2. Determination of the digestibility of gastric juice. The value of the digestibility of pancreatic juice and bile during digestion. Auscultation, percussion of cicatricial activity in ruminants. Obtaining a capacious scar in ruminants	2			6	
3. Determination of the total mass of microorganisms. Determination of ammonia content in the scar fluid.				4	
Topic 2. Physiology of CCC.		**2**		**20**	1, 2, 3, 4, 10, 11
1. Properties of the heart muscle. Study of the heart. The effect of various stimuli on cardiac activity.		2		10	
2. Research of arterial pulse and pressure. Determination of the cardiac zone and study of heart tones in cows				10	
Topic 3. Physiology of respiration				**20**	1,2, 3, 4, 6
1. Study of respiration in animals				10	
2.Determination of vital capacity of the lungs				6	
3. Determination of surfactant				4	
Topic 4. Physiology of metabolism and thermoregulation				**10**	
1. Determination of basal metabolism. Calculation of consumption of proteins, fats, carbohydrates in humans. Measurement of body temperature in animals.				10	
Topic 5. Physiology of the excretory system				**10**	1,2,3, 6, 8
1. Obtaining urine in animals and studying the density and reaction of urine. The influence of various factors on the formation of urine.				10	
Topic 6. Physiology of animal reproduction				**10**	1, 2, 3, 4, 7
1. Determination of the structure and movement of sperm. Counting the number of sperm. Examination of sperm under a microscope. Determining the influence of various factors on sperm.				10	
Topic 7. Physiology of lactation				**26**	1, 2, 3, 4, 10,
1. Study of the composition of milk and milk fat. Study of the properties of colostrum				26	
Total	**2**	**2**		**116**	

4. TEACHING AND LEARNING METHODS

MLOs	Teaching methods (directed study)	Hours	Learning methods (self-directed study)	Hours
- Know the patterns of life processes (metabolism, respiration, blood circulation, digestion,	In the process of providing material on the physiology of animals at lectures will be the following work:	2	In the process of lectures and PHC, the student must independently perform:	146

excretion, etc.) at different structural levels. - Be able to practically apply the acquired knowledge. - Know the mechanisms that ensure the interaction of individual systems and organs as a whole with the external environment. - Be able to use tools, instruments, devices for research and assessment of animals. -Know the qualitative differences in physiological functions in animals in different environmental conditions. - Be able to use the acquired knowledge to highlight theoretical and practical problems in production - Know the formation of physiological functions, their formation at different stages of individual development. - Be able to apply knowledge in practice. - Know the elements of conducting and organizing scientific physiological research. - Be able to determine the conditions of physiological existence of animals in the environment	- presentation of lecture material according to the plan; - discussion of lecture material; - proposals for literature on each topic of lectures; - use of Moodle, Zoom during the lecture - consultations of students in the process of mastering OK in physiology - methodical design of all types of student work; - control of the educational process individually by each student (modules, tests, exams)	2	- registration of a research notebook - mastering research methods; - independent work during research - fixation of research results; - analysis of research results; - drawing conclusions from the received data; - fixation of lecture material - obligatory preparation for the hospital, mastering the lecture material for the hospital.	30 40 30

5. ASSESSMENT

5.1. Diagnostic assessment

5.2. Summative assessment

5.2.1. Intended learning outcomes methods:

No	Summative assessment methods	Grades	Deadline
	3-d semester		
	Assessment of the ability to plan the location and arrangement of veterinary passages, barriers, isolators for infected animals or other objects of protection of the farm from the introduction of infectious agents	5/5%	By the end of the 2 weeks
	Assessment of the ability to prepare and conduct an allergic diagnostic test for tuberculin, record the reaction to it (based on vivarium) and complete the act.	5/5%	By the end of the 3 weeks
	Assessment of the ability to prepare and select material for laboratory tests, compile an accompanying document and describe the nature of one of the serological reactions	5/5%	By the end of the 5th week
	Testing the ability to analyze the data obtained during the epidemiological examination, to form assumptions about possible causes and draw up an act.	5/5%	By the end of the 6 weeks
	Computer testing (multiple choice) "General epizootology 1" in	10/10%	By the end of 6 weeks
	Focus group with mutual evaluation on understanding the principles of production, use and action of biologicals	5/5%	In the 7th lesson
	Assessment of the ability to prepare and immunize animals / poultry (based on vivarium) and draw up an act.	5/5%	By the end of the 9th week
	Development of the plan of anti-epizootic measures on liquidation of an infectious disease and the project of the decision of DNPK (the order of the chairman of the district state administration) concerning its realization	10/10%	By the end of the 11th week
	Solving problems to calculate the needs of disinfectants for disinfection and drawing up a disinfection report	5/5%	By the end of the 13th week
	Testing the ability to navigate the range of rodenticides and insecticides when choosing products for rodent control and disinsection. Debate	5/5%	By the end of the 15th week
	Computer testing (multiple choice) "General epizootology 2" in Moodle	10/10%	By the end of the 15th week
	Attestation	15/15%	By the end of the 8th week
	Performing the tasks	15/15%	By the end of the 15th week
	Total in 6-th semester	100/100%	
	4-th semester		
1	Simulation exercise "Anthrax. Diagnosis, quarantine”	10/10%	In the 2nd lesson
2	Simulation exercise "Elimination of tuberculosis"	10/10%	In the 3 lesson

3	Simulation exercise "The case of rabies. Diagnosis and elimination "	10/10%	In the 7th lesson
4	Simulation exercise "Elimination of an outbreak of transboundary disease (FMD)"	10/10%	In the 8th lesson
5	Plan of anti-epizootic measures to eliminate the disease (by options)	20/20%	By the end of the 15th week
6	Computer testing (multiple choice) "Common diseases" in Moodle	10/10%	By the end of the 15th week
7	Attestation	15/15%	By the end of the 8th week
8	Individual task (list of topical vaccines against the disease by task)	15/15%	By the end of the 15th week
	Total in 4-th semester	100/100%	

5.2.2. Grading criteria

Summative assessment method	Unsatisfactory	Satisfactory	Good	Excellent
Assessment of the ability to plan the location and arrangement of veterinary passages, barriers, isolators for infected animals or other objects of protection of the farm from the introduction of infectious agents	0-2	3	4	5
	The requirements are not oriented	Requirements are not met all or with errors	Requirements are taken into account, the plan of arrangement and arrangement is substantiated	Requirements are considered, the plan of arrangement and arrangement is grounded
Assessment of the ability to prepare and conduct an allergic diagnostic test for tuberculin, record the reaction to it (based on vivarium) and complete the act.	0-2	3	4	5
	Does not guided in the procedure.	The sequence of the procedure is followed with gross errors	The procedure is correctly performed on the object.	The procedure is explained in detail and correctly performed on a living object.
Assessment of the ability to prepare and select material for laboratory tests, compile an accompanying document and describe the nature of one of the serological reactions	0-2	3	4	5
	Does not guided in the procedure.	The sequence of the procedure is followed with gross errors	The procedure is correctly performed on the object.	The procedure is explained in detail and correctly performed on a living object.
Testing the ability to analyze the data obtained during the epidemiological examination, to form assumptions about possible causes and draw up an act.	0-2	3	4	5
	Task requirements not met	Most requirements are met, but some components are missing or insufficiently met	All task requirements are met	Task requirements are met, while creativity and thoughtfulness are demonstrated
Focus group with mutual evaluation on understanding the principles of production, use and action of biologicals	0-2	3	4	5
	Does not orient	Is able to divide biological products into groups according to purpose	Is able to divide biological products into groups and subgroups according to the principle of action and purpose	Is able to assess the correctness of the division of biological products into subgroups and justify the identified errors
Assessment of the ability to prepare and immunize animals / poultry (based on vivarium) and draw up an act.	0-2	3	4	5
	Does not guided in the procedure.	The sequence of the procedure is followed with gross errors	The procedure is correctly performed on the object.	The procedure is explained in detail and correctly performed on a living object.
Development of the plan of anti-epizootic measures on liquidation of an infectious disease and the project of the decision of DNPK (the order of the chairman of the district state administration) concerning its realizati	0-4	5-7	8-9	10
	Task requirements not met	Most requirements are met, but some components are missing or insufficiently met	All task requirements are met	Task requirements are met, while creativity and thoughtfulness are demonstrated

Solving problems to calculate the needs of disinfectants for disinfection and drawing up a disinfection report	0-2	3	4	5
	The problem is solved incorrectly	The problem is generally solved, but with gross errors	The calculation was carried out correctly, the act was drawn up	The requirements of the task are met, while demonstrating creativity and thoughtfulness
Test the ability to navigate the range of rodenticides and insecticides when choosing products for rodent control and disinsection (focus groups)	0-2	3	4	5
	Task requirements not met	Most requirements are met, but some components are missing or insufficiently met	All task requirements are met	Task requirements are met, while creativity and thoughtfulness are demonstrated
Simulation exercise on topics with the distribution of points on the basis of mutual evaluation	0-4	5-7	8-9	10
	Role not completed	The role is generally fulfilled, with hints and corrections	The role is fulfilled, knowledge of the instruction on struggle against illness is shown, uncertainty is shown	The role is performed with creativity, demonstrated knowledge of instructions for combating the disease, the ability to communicate, argue and show determination in defending their position
Plan of anti-epizootic measures to eliminate the disease (by options)	0-4 (×2, ×3)	5-7 (×2, ×3)	8-9 (×2, ×3)	10 (×2, ×3)
	Task requirements not met	Most requirements are met, but some components are missing or insufficiently met	All task requirements are met	Task requirements are met, while creativity and thoughtfulness are demonstrated

5.3. Formative assessment

Formative exercises are designed to enable students to develop particular aspects of their learning, prior to summative assessments. Formative exercises are designed to help students use feedback and self-reflection to manage and develop their learning so that they can see how to improve their work.

No	Formative Assessment elements	Date
	Autumn semester	
1.	Feedback aimed at supporting the student in understanding the correctness of the documentation	Each time you check the completed acts and accompanying
2.	Self-check for knowledge of the sequence of actions when performing procedures (diagnostic, preventive, veterinary and sanitary) based on the results of the analysis of performed blitz tasks	Blitz control at the beginning of 2,3,4,7,8,10, 14 and 15 classes (in the 6th semester)
	Evaluation of the activity and effectiveness of applicants' participation in focus groups and role-playing in simulation exercises. Comments and tips.	Each time in the form of focus groups or simulation exercises
	Feedback with comments and recommendations on how to solve problems	11th week
	Oral review and correction of plans for anti-epizootic measures to eliminate the disease (by options)	According to the schedule by topics

Self-assessment can be used both an element of formative and summative assessment.

6. LEARNING RESOURCES

6.1. Key resources

1. Мазуркевич А. Й., Трокоз В. О., Карповський В. І. Фізіологія сільськогосподарських тварин : практикум. Київ : Центр учбової літератури, 2016. 240 с.

2. Мазуркевич А. Й., Трокоз В. О., Карповський В. І. Фізіологія сільськогосподарських тварин: практикум. Київ : Центр учбової літератури, 2020. 240 с.

3. Кучковський О. М., Малько М. М. Практикум з фізіології людини і тварин. Запоріжжя: ЗНУ, 2016. 159 с.

4. Науменко В.В., Дячинський А.С., Демченко В. Ю., Дерев'янко І.Д. Фізіологія сільськогосподарських тварин: підручник. Київ : Центр навчальної літератури, 2019. 832 с.

5. Пасічніченко О. М., Макарчук М. Ю. Фізіологія нервів і м'язів : навчальний посібник. Київ, 2020. 157с

6.2. Guidelines

1.https://books.google.com.ua/books?id=pbvXCQAAQBAJ&printsec=frontcover&redir_esc=y#v=onepage&q&f=false

2.https://ukrayinska.libretexts.org/Медицина/Ветеринарна_медицина/Книга%3A_Вступна_фізіологія_тварин_(Hinić-Frlog)

6.3. Additional resources

6. General course of physiology of man and animals edited by prof. Nozdracheva AD - Moscow "Higher School". - 1991 - in two volumes. - 1023 s.

7. Dictionary-reference book on anatomy and physiology sgtvaryn, VIKindya, YAKurovsky, etc. - Kyiv, "Harvest". - 1993. - 431p.

8. Physiology of farm animals, workshop, edited by prof. Naumenko VV - Kyiv, Agropromvydav Ukrainy - 1991. - 231 p.

9. Physiology of farm animals edited by prof. Naumenko VV - Kyiv, Agropromvydav of Ukraine. - 1997. - 482 p.

10. Physiology of man and animal: Textbook / GM Chaichenko., VO Tsybe

11.Антоняк Г. Л., Влізло В. В., Іскра Р. Я., Панас Н. Є., Коцюмбас І. Я. Кальцій в організмі людини і тварин. Київ: Аграрна наука, 2019. 224 с.

12. Березовський А. В., Харенко М. І., Хомин С.П. Фізіологія та патологія розмноження дрібних тварин : навчальний посібник. Суми : Полісся, 2017. 392 с.

13. Пасічніченко О. М., Воробйова А. П. Методичні рекомендації до лабораторного практикуму з фізіології людини і тварин. Фізіологія вегетативної нервової системи. Київ, 2020. 38 с