NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCES OF UKRAINE

Department of Internal Animal Diseases

APPROVED:
Faculty of veterinary medicine
"____" _____ 2026

CURRICULUM OF ACADEMIC DISCIPLINE
CLINICAL DIAGNOSIS OF ANIMAL DISEASES (full duration of study)

Area of knowledge Veterinary medicine
Specialty _211 - "Veterinary medicine"_____
Academic programme _Veterinary medicine_____
Faculty (Education and research institute) Internal Animal Diseases
Developed by: Andrii Zemlianskyi, Associate Professor, PhD_____
(academic degree)

KYIV – 2026

Description of the discipline "Clinical diagnosis of animal diseases" is one of the first clinical subjects that teaches students the principles of recognizing animal diseases. It serves as an introductory foundation for studying other specialized clinical disciplines and is a methodological basis of clinical veterinary medicine.

Area of knowledge, specialty, academic programme, academic degree		
Academic degree	*master*	
Specialty	*211 - "Veterinary medicine"*	
Academic programme	*Veterinary medicine*	
Characteristics of the discipline		
Type	*mandatory*	
Total number of hours	*210*	
Number of ECTS credits	*7*	
Number of modules	*6*	
Course project (work) (if any)	*Course project*	
Form of assessment	*exam / credit*	
Indicators of the discipline for full-time and part-time forms of university study		
	University study	
	Full-time	**Part-time**
Year of study	*3*	
Term	*5,6*	
Lectures	*60 hours*	*hours*
Practical classes and seminars		*hours*
Laboratory classes	*90 hours*	*hours*
Self-study	*30 hours*	*hours*
Number of hours per week for full-time students	*10 hours*	

1. **Aim, competences and expected learning outcomes of the discipline**

Aim: train students to apply clinical, instrumental, and lab diagnostic methods systematically when examining animals, analyzing symptoms, and diagnosing logically.

List of academic disciplines that precede the study of: "Anatomy of domestic animals", "Cytology, histology, and embryology", "Veterinary microbiology", "Animal physiology", "Animal pathophysiology", "Veterinary immunology", "Veterinary virology"

Competences acquired:

Integral competence (IC): Solve complex problems in veterinary medicine involving research and innovation under uncertain conditions.

General competence (GC):

GC1. Ability for abstract thinking, analysis, and synthesis.
GC2. Ability to apply knowledge in practical situations.
GC3. Knowledge and understanding of the subject area and profession.
GC7. Ability to conduct research at an appropriate level.
GC8. Ability to learn and master modern knowledge.
GC9. Ability to make well-founded decisions.
GC11. Ability to assess and ensure the quality of performed work.

GC 13. Ability to make decisions and act in accordance with the principle of intolerance to corruption and any other manifestations of dishonesty and lack of integrity.

Special (professional) competence (SC):

SC 2. Use diagnostic tools and equipment

SC 3. Ensure occupational safety, asepsis, antisepsis

SC 4. Conduct clinical examinations

SC 6. Handle biological samples

SC 7. Organize and analyze lab diagnostics

SC 8. Treat infectious and non-infectious diseases

SC 10. Develop disease prevention strategies

Program Learning Outcomes (PLOs)

PLO 1 – Know and correctly use veterinary medical terminology.

PLO 2 – Use information from domestic and international sources to develop diagnostic, therapeutic, and business strategies.

PLO 3 – Understand the essence of physical, chemical, and biological processes in animal organisms under both normal and pathological conditions.

PLO 4 – Collect anamnesis during registration and examination of animals, and make decisions regarding effective diagnostic, treatment, and disease prevention methods.

PLO 5 – Establish a connection between clinical symptoms and laboratory findings.

PLO 10 – Propose and apply appropriate innovative methods and approaches to solve professional challenges.

PLO 20 – Possess specialized software tools for professional tasks.

Expected learning outcomes (ELO):

ELO 1. Demonstrate an understanding of the ethical and legal frameworks within which a veterinary medicine doctor must operate, including professional aspects, aspects related to animal welfare, animal owners, public health, and the social and environmental aspects associated with professional activities.

ELO 5. Communicate effectively with animal owners, the public, professional colleagues, and relevant authorities, using language appropriate for the respective audience and adhering to the principles of full respect for confidentiality and privacy.

ELO 7. Properly maintain clinical records and documentation for animal owners, as well as, where necessary, clinical case reports in a form satisfactory to the relevant audience.

ELO 9. Demonstrate the ability to think critically and to review and evaluate literature and presentations.

ELO 11. Demonstrate the ability to critically analyze evidence, cope with incomplete information, resolve unforeseen situations, and adapt knowledge, skills, and practical competencies to various professional situations.

ELO 14. Demonstrate commitment to lifelong learning, personal improvement, and professional development. This includes recording and reflecting on professional experience, as well as taking measures to improve professionalism and competence.

ELO 18. Conduct a complete clinical examination and demonstrate the personal ability to make independent clinical decisions.

ELO 24. Use basic diagnostic equipment and effectively conduct animal examinations according to the specific case, in compliance with good healthcare and biosecurity practices

and current regulatory requirements. Understand the contribution of digital tools and artificial intelligence to the theory and practice of veterinary medicine.

2. Programme and structure of the discipline

Modules and topics	Number of hours						
	full-time						
	weeks	total	weeks				
			l	p	lab	ind.	s.st.
1	2	3	4	5	6	7	8
Module 1. GENERAL DIAGNOSTICS							
Topic 1. Development of the discipline "Clinical Diagnostics of Animal Diseases" in an historical aspect. From origins to the present: the Department of Internal Animal Diseases in facts and names. The essence and significance of the discipline, its connection with other disciplines. Concepts of symptoms, syndromes, diagnosis, prognosis. Clinical examination protocol. Full clinical history of the patient and the concept of early disease detection. Communication skills with clients, colleagues, and support staff in written and oral forms. Initial acquaintance with the animal: registration and anamnesis (case history).	1-2	14	4		6		4
Topic 2. Examination of the coat (hair), skin, and subcutaneous tissue. Diagnostic significance of pathological changes in the skin and subcutaneous tissue.	3-4	10	4		6		
Topic 3. Diagnostic significance of the examination of visible mucous membranes and lymph nodes. Thermometry.	5-6	6	2		4		
Total for Module 1		**30**	**10**		**16**		**4**
Module 2. CARDIOVASCULAR SYSTEM EXAMINATION							
Topic 4. Protocol for the examination of the cardiovascular system. Inspection, palpation.	7-8	4	2		2		
Topic 5. Examination of heart sounds by auscultation. Changes in heart sounds in pathologies.	9-10	6	2		4		
Topic 6. Heart murmurs. Heart defects and their diagnosis.	11-12	6	2		4		
Topic 7. The concept of "early detection" of cardiovascular diseases. Electrocardiography.	13	6	2		2		2
Topic 8. Visual diagnostics of the cardiovascular system: Ultrasound and X-ray examination of the heart.	14	4	2		2		
Topic 9. Arrhythmias. Analysis of clinical cases with pathology of the cardiovascular system.	15	4	2		2		
Total for Module 2		**30**	**12**		**16**		**2**
Module 3. EXAMINATION OF THE RESPIRATORY SYSTEM							
Topic 10. Protocol for the examination of the respiratory system of animals. General clinical methods for examining the upper (anterior) airways. The concept of "early detection" of respiratory diseases.	1	10	2		4		4
Topic 11. Diagnostic significance of examining the chest in the lung area using methods of inspection, palpation, and percussion.	2	6	2		4		

Topic 12. Auscultation of the lungs and its diagnostic value. Main respiratory sounds and their changes under physiological and pathological conditions. Visual diagnostics: X-ray examination of the respiratory system. Analysis of clinical cases with respiratory pathology.	3	14	4		4		6
Total for Module 3		**30**	**8**		**12**		**10**
Module 4. EXAMINATION OF THE DIGESTIVE ORGANS AND LIVER							
Topic 13. Protocol for the examination of the digestive system of animals. Clinical significance of the examination of the oral cavity, pharynx, esophagus, crop, rumen.	4	6	2		4		
Topic 14. External examination of abdominal organs and its clinical significance (examination of forestomachs, abomasum, and stomach).	5	8	2		6		
Topic 15. Examination of the stomach and intestines of monogastric animals. Visual diagnostics of the digestive system: Endoscopy. The concept of "early detection" of digestive system diseases. Analysis of clinical cases with digestive system pathology.	6	10	4		4		2
Topic 16. General clinical methods for examining the liver in animals.	7	6	2		4		
Total for Module 4		**30**	**10**		**18**		**2**
Module 5. EXAMINATION OF THE URINARY AND NERVOUS SYSTEMS							
Topic 17. Protocol for the examination of the urinary system. The concept of "early detection" of urinary system diseases. Diagnostic significance of clinical methods for examining the kidneys and urinary tract. Visual diagnostics of the urinary system: Ultrasound, X-ray, biopsy, cystoscopy.	7	10	4		4		2
Topic 18. Examination of physical and chemical properties of urine and their diagnostic significance. Examination of urine sediments. Analysis of clinical cases with urinary system pathology.	8-9	6	2		4		
Topic 19. Protocol for the examination of the nervous system. The concept of "early detection of nervous system diseases." Visual diagnostics of the nervous system: radiography, MRI, CT, electroencephalography, chronaximetry, myelography, radiotelemetry.	10	8	4		4		
Topic 20. Examination of animal behavior, skull and spine, sense organs and their diagnostic value. Examination of sensitivity, reflexes, coordination of movements, convulsions, paresis, and paralysis, and their diagnostic significance. Analysis of clinical cases with nervous system pathology.	11	6	2		2		2
Total for Module 5		**30**	**12**		**14**		**4**
Module 6. EXAMINATION OF THE BLOOD SYSTEM							
Topic 21. Protocol for the examination of the blood system. Diagnostic value of the study of physical and morphological blood parameters. Leukogram and its diagnostic significance. Leukocytosis, leukocytopenia, and their clinical significance.	12-13	16	4		6		6

Topic 22. Biochemical blood test. Clinical cases: analysis of blood parameters for various pathologies in animals.	14	6	2		4		
Topic 23. Generalization of the study of the discipline "Clinical Diagnostics of Animal Diseases". The logic of making a diagnosis based on the acquired knowledge, practical skills, and competences. Clinical history of the patient (on the example of clinical cases).	15	8	2		4		2
Total for Module 6		**30**	**8**		**14**		**8**
Coursework on clinical examination of animals							
Total hours		**180**	**60**		**90**		**30**

3. Lecture Topics

for the course “Clinical Diagnostics of Animal Diseases” for full-time higher education students majoring in Veterinary medicine

No.	Lecture Topic	Hours
1	**Lecture 1.** The essence and significance of the discipline and its relationship with other disciplines. Concepts of symptoms, syndromes, diagnosis, and prognosis. Clinical examination protocol. Complete clinical history of the patient and the concept of early disease detection. Communication skills with clients, colleagues, and support staff in written and oral forms. Initial acquaintance with the animal: registration, anamnesis (case history), and habitus.	4
2	**Lecture 2.** Examination of the coat (hair), skin, and subcutaneous tissue. Diagnostic significance of pathological changes in the skin and subcutaneous tissue.	4
3	**Lecture 3.** Diagnostic significance of examining visible mucous membranes and lymph nodes. Thermometry.	2
4	**Lecture 4.** Protocol for examination of the cardiovascular system. Inspection and palpation.	2
5	**Lecture 5.** Examination of heart sounds by auscultation. Changes in heart sounds in pathological conditions.	2
6	**Lecture 6.** Heart murmurs. Heart defects and their diagnosis.	2
7	**Lecture 7.** The concept of early detection of cardiovascular diseases. Electrocardiography.	2
8	**Lecture 8.** Visual diagnostics of the cardiovascular system: ultrasound and radiographic examination of the heart.	2
9	**Lecture 9.** Arrhythmias. Analysis of clinical cases involving cardiovascular pathology.	2
10	**Lecture 10.** Protocol for examination of the respiratory system in animals. General clinical methods for examining the upper respiratory tract. The concept of early detection of respiratory diseases.	2
11	**Lecture 11.** Diagnostic significance of examination of the thorax in the lung area using inspection, palpation, and percussion.	4
12	**Lecture 12.** Auscultation of the lungs and its diagnostic significance. Main respiratory sounds and their changes under physiological and pathological conditions. Visual diagnostics: radiographic examination of the respiratory system. Analysis of clinical cases involving respiratory pathology.	2
13	**Lecture 13.** Protocol for examination of the digestive system in animals. Clinical significance of examination of the oral cavity, pharynx, esophagus, crop, and rumen.	2
14	**Lecture 14.** External examination of abdominal organs and its clinical significance (examination of the forestomachs, abomasum, and stomach).	4
15	**Lecture 15.** Examination of the stomach and intestines of monogastric animals. Visual diagnostics of the digestive system: endoscopy. The concept of early detection of digestive system diseases. Analysis of clinical cases involving digestive system pathology.	4

16	**Lecture 16.** General clinical methods for examination of the liver in animals.	2
17	**Lecture 17.** Protocol for examination of the urinary system. The concept of early detection of urinary system diseases. Diagnostic significance of clinical methods for examination of the kidneys and urinary tract. Visual diagnostics of the urinary system: ultrasound, radiography, biopsy, and cystoscopy.	4
18	**Lecture 18.** Examination of the physical and chemical properties of urine and their diagnostic significance. Examination of urine sediment. Analysis of clinical cases involving urinary system pathology.	2
19	**Lecture 19.** Protocol for examination of the nervous system. The concept of early detection of nervous system diseases. Visual diagnostics of the nervous system: radiography, MRI, CT, electroencephalography, chronaximetry, myelography, and radiotelemetry.	4
20	**Lecture 20.** Examination of animal behavior, the skull and spine, sensory organs, and their diagnostic significance. Examination of sensitivity, reflexes, coordination of movements, and convulsions.	2
21	**Lecture 21.** Protocol for examination of the blood system. Diagnostic significance of physical and morphological blood parameters. Leukogram and its diagnostic significance. Leukocytosis, leukocytopenia, and their clinical significance.	4
22	**Lecture 22.** Biochemical blood examination. Clinical cases: analysis of blood parameters in various animal diseases.	2
23	**Lecture 23.** Generalization of the study of the discipline “Clinical Diagnostics of Animal Diseases.” The logic of making a diagnosis based on acquired knowledge, practical skills, and competencies. Clinical history of the patient (based on clinical case examples).	2

Total 60

4. Laboratory Classes

for the course “Clinical Diagnostics of Animal Diseases” for higher education students majoring in Veterinary medicine for the 2026–2027 academic year

No.	Topic	Hours
	Module 1. General diagnostics	
1	General diagnostics. Approach to animals and methods of restraint.	4
2	Registration and anamnesis. Assessment of habitus.	2
3	Examination of the coat (hair), skin, and subcutaneous tissue.	4
4	Pathological changes of the skin and hair coat.	2
5	Examination of visible mucous membranes.	2
6	Examination of lymph nodes. Thermometry.	2
	Module 2. Cardiovascular system examination	
7	Examination of the cardiovascular system. Assessment of the cardiac impulse. Cardiac percussion and its clinical significance.	2
8	Cardiac auscultation. Heart sounds.	4
9	Heart murmurs. Heart defects.	4
10	Electrocardiography (ECG).	2
11	Examination of blood vessels. Assessment of venous and arterial blood pressure.	2
12	Arrhythmias.	2
	Module 3. Respiratory system examination	
13	Examination of the respiratory system. Examination of the upper respiratory tract.	2
14	Inspection, palpation, and percussion of the thorax in the lung area.	4
15	Lung auscultation and its clinical significance.	4
16	Application of radiography in the diagnosis of respiratory diseases in animals.	2
	Module 4. Digestive system and liver examination	

17	Examination of the digestive system. Assessment of appetite and feed and water intake.	2
18	Examination of the oral cavity, pharynx, and esophagus.	2
19	Intubation (probing) of the esophagus, stomach, rumen, crop, and reticulum.	4
20	External examination of abdominal organs in cattle and small ruminants (rumen, reticulum, omasum, abomasum, intestines).	4
21	External examination of abdominal organs in horses, pigs, and small animals.	2
22	Examination of the intestines. Rectal examination.	4
23	Radiographic examination of abdominal organs.	2
24	Examination of the liver in animals.	2
Module 5. Urinary and nervous system examination		
25	Examination of the urinary system. Clinical methods for urinary system examination.	2
26	Catheterization of the urethra and urinary bladder.	2
27	Urinalysis. Determination of physical and chemical properties of urine. Microscopic examination of urine sediment for the detection of organized and unorganized urinary sediments.	4
28	Ultrasonographic and radiographic examination of the kidneys.	2
29	Examination of the nervous system. Assessment of animal behavior, sensory organs, sensitivity, and reflexes.	4
Module 6. Blood system examination		
30	Examination of the blood system. Methods and techniques of blood collection in different animal species. Determination of physical blood parameters. Counting erythrocytes and leukocytes in animals of different species. Preparation, fixation, and staining of blood smears.	4
31	Preparation and interpretation of leukograms in different animal species.	4
32	Determination of biochemical blood parameters in animals.	4
33	Clinical cases	4

Total 90

5. Independent study topics

for the course “Clinical Diagnostics of Animal Diseases” for higher education students majoring in Veterinary Medicine for the 2026–2027 Academic Year

No.	Topic	Hours
1	Development of communication skills with clients, colleagues, and support staff in veterinary practice. Familiarization with additional methods of clinical examination of animals.	4
2	Pathological changes in heart sounds in non-infectious diseases. Diagnostic significance of heart murmurs.	2
3	Modern diagnostic methods for cardiovascular diseases: visual diagnostics and electrocardiography.	4
4	Additional methods for examination of the respiratory system in animals and their interpretation.	6
5	Additional methods for examination of the digestive system in animals and their interpretation.	2
6	Additional methods for examination of the urinary system in animals and their interpretation.	2
7	Application of modern non-invasive methods for diagnosing nervous system disorders in animals.	2
8	Blood collection techniques in poultry. Morphological examination of avian blood.	6
9	Clinical cases analyses	2

Total 30

6. Methods of assessing expected learning outcomes

- oral or written survey;
- interview;
- test;
- defending laboratory/practical, design/graphical works, projects;
- peer-to-peer assessment, self-assessment.

7. Teaching methods*:*

- problem-based method;
- practice oriented studying method;
- case method;
- project education method;
- flipped classroom, mixed education method;
- research based method;
- learning discussions and debates method;
- team work, brainstorm method
- gamification studying method.

8. Results assessment.

The student's knowledge is assessed by means of a 100-point scale converted into the national grades according to the "Exam and Credit Regulations at NULES of Ukraine" in force

8.1. Distribution of points by types of educational activities

Type of Learning Activity	Learning Outcomes	Points
MODULE 1. GENERAL DIAGNOSTICS (Semester 5)		
Topic 1. The essence and significance of the discipline. Symptoms, syndromes, diagnosis, prognosis. Clinical examination protocol. Clinical history and early disease detection. Communication skills. Registration, anamnesis, habitus		
Lecture 1	Attendance and participation	–
Laboratory Class 1	Students should understand the significance of the discipline in the training of a Doctor of Veterinary Medicine; know the objectives and tasks of the course; distinguish between symptom, syndrome, diagnosis, and prognosis; be able to restrain animals and understand the protocol of clinical examination and animal restraint.	10
Laboratory Class 2	Be able to register animals and collect anamnesis. Understand the significance of registration and anamnesis data and use the information for further clinical examination.	5
Laboratory Class 3	Be able to determine animal habitus and assess indicators of general health status.	10
Independent Study 1	Understand the application of auscultation in veterinary medicine, its methodology, and diagnostic significance.	5
Topic 2. Examination of the coat, skin, and subcutaneous tissue. Diagnostic significance of pathological skin changes		
Lecture 2	Attendance and participation	–
Laboratory Class 4	Know the sequence of general clinical examination. Be able to examine the skin and	10

	hair coat of different animal and bird species.	
Laboratory Class 5	Distinguish pathological skin changes; analyze, interpret, and apply modern diagnostic tests for skin and hair coat examination.	10
Independent Study 2	Know additional diagnostic methods used in veterinary practice.	5
Topic 3. Examination of visible mucous membranes, lymph nodes, and thermometry.		
Lecture 3	Attendance and participation	–
Laboratory Class 6	Know the examination technique and be able to assess visible mucous membranes, identify abnormalities, and interpret findings.	10
Laboratory Class 7	Know examination techniques for superficial lymph nodes and thermometry in different animal species; identify pathological changes and use results for further clinical examination.	5
Module Examination	Module assessment test	30
Total for Module 1		**100**
MODULE 2. CARDIOVASCULAR SYSTEM EXAMINATION		
Topic 4. Cardiovascular examination protocol. Inspection and palpation.		-
Laboratory Class 8	Know the cardiovascular examination protocol and general/special diagnostic methods. Be able to examine the cardiac impulse.	10
Topic 5. Heart sounds and auscultation		
Lecture 5.	Attendance and participation	-
Laboratory Class 9	Perform palpation and percussion of the heart; differentiate heart sounds and recognize physiological and pathological changes.	10
Topic 6. Heart murmurs and cardiac defects.		
Lecture 6.	Attendance and participation	-
Laboratory Class 10	Understand heart murmurs, their mechanisms, diagnosis, and differentiation. Diagnose heart defects and interpret results.	10
Laboratory Class 11	Assess pulse and arterial blood pressure in different animal species and interpret results.	10
Topics 7–8. Early detection of cardiovascular diseases. ECG, ultrasound, and radiography.		
Lectures 7-8	Attendance and participation	-
Laboratory Class 12	Perform ECG, echocardiography, and radiographic examinations; distinguish normal and pathological findings and use these methods in diagnosis.	10
Topic 9. Arrhythmias. Clinical case analysis.		
Lecture 9		-
Laboratory Class 13	Understand arrhythmias, their mechanisms, analyze ECGs, and interpret findings.	10
Independent Study 3	Understand the theoretical basis of additional cardiovascular diagnostic methods.	10
Module Examination		30
Total for Module 2		**100**
Semester Academic Performance		$(M_1+M_2)/2*0,7 <70$
Credit Test		**30**
MODULE 3. RESPIRATORY SYSTEM EXAMINATION (Semester 6)		
Topic 10. Protocol for the examination of the respiratory system in animals. General clinical methods for		

examination of the upper respiratory tract. The concept of early detection of respiratory diseases		
Lecture 10	Attendance and participation	-
Laboratory Class 1.	Conduct examination of the upper respiratory tract; distinguish normal and pathological findings; apply general and specialized diagnostic methods.	10
Topic 11. Diagnostic significance of examination of the thorax in the lung area by means of inspection, palpation, and percussion		
Lecture 11	Attendance and participation	
Laboratory Class 2.	Perform inspection, palpation, and percussion of the thorax; interpret normal and abnormal findings.	10
Independent Study 1	Additional respiratory diagnostic methods.	20
Topic 12. Lung auscultation and its diagnostic significance. main respiratory sounds and their changes under physiological and pathological conditions. visual diagnostics: radiographic examination of the respiratory system. analysis of clinical cases with respiratory pathology in animals		
Lecture 12	Attendance and participation	-
Laboratory Class 3.	Master lung auscultation; distinguish primary and secondary respiratory sounds; interpret findings.	10
Laboratory Class 4.	Perform radiographic examination of the respiratory system and interpret radiographic findings.	20
Module Examination		30
Total for Module 3		**100**
Module 4. EXAMINATION OF THE DIGESTIVE ORGANS AND THE LIVER		
Topic 13. Protocol for the examination of the digestive system in animals. clinical significance of examination of the oral cavity, pharynx, esophagus, crop, and rumen		
Lecture 13	Attendance and participation	
Laboratory Class 5.	Examine feed and water intake, oral cavity, pharynx, esophagus, crop, and rumen; distinguish normal and pathological findings.	10
Laboratory Class 6.	Perform esophageal intubation in different animal species.	10
Topic 14. External examination of the abdominal cavity organs and its clinical significance (examination of the forestomachs, abomasum, and stomach).		
Lecture 14	Attendance and participation	-
Laboratory Class 7	Conduct external abdominal examination and assess forestomachs and abomasum in ruminants.	10
Topic 15. Examination of the stomach and intestines in monogastric animals. Visual diagnostics of the digestive system: endoscopy. The concept of “early detection” of diseases of the digestive system. Analysis of clinical cases involving pathology of the digestive system.		
Lecture 15	Attendance and participation	
Laboratory Class 8.	Examine the stomach and intestines of monogastric animals; interpret findings.	10
Laboratory Class 9	Interpret radiographic examinations of the stomach and intestines in monogastric animals.	10
Independent Study 2	Additional digestive system diagnostics and endoscopy.	10
Topic 16. General clinical methods for examining the liver in animals.		
Lecture 16	Attendance and participation	

Laboratory Class 10	Apply various liver examination methods in animals.	10
Module Examination		30
Total for Module 4		**100**
Module 5. EXAMINATION OF THE URINARY AND NERVOUS SYSTEMS.		
Topic 17. Protocol for examining the urinary system. The concept of "early detection" of urinary system diseases. Diagnostic significance of clinical methods for examining the kidneys and urinary tract. Visual diagnostics of the urinary system: ultrasound (US), X-ray, biopsy, cystoscopy.		
Lecture 17	Attendance and participation	-
Laboratory Class 11.	Examine kidneys and urinary tract using clinical and specialized methods; distinguish normal and pathological findings.	10
Laboratory Class 12	Perform urinary catheterization in different animal species.	10
Topic 18. Examination of the physicochemical properties of urine and their diagnostic significance. Examination of urinary sediments. Analysis of clinical cases involving pathology of the urinary system		
Lecture 18	Attendance and participation	
Laboratory Class 13.	Assess physical and chemical properties of urine and interpret findings.	10
Laboratory Class 14	Examine urine sediment and interpret pathological findings.	10
Topic 19. Protocol for examination of the nervous system. The concept of "early detection" of nervous system diseases. Visual diagnostics of the nervous system: radiography, MRI, CT, electroencephalography (EEG), chronaximetry, myelography, radiotelemetry. **Topic 20.** Diagnostic significance of studying animal behavior, the skull and spine, and sensory organs. Diagnostic significance of examining sensitivity, reflexes, coordination of movements, convulsions, paresis, and paralysis.		
Lectures 19-20	Attendance and participation	-
Laboratory Class 15.	Perform neurological examination, including behavior, sensory organs, reflexes, sensitivity, coordination, paresis, and paralysis assessment.	10
Independent Study 3	Additional diagnostic methods for the nervous system.	10
Module Examination		30
Total for Module 5		**100**
Module 6. EXAMINATION OF THE BLOOD SYSTEM		
Topic 21. Protocol for examination of the blood system. Diagnostic significance of studies of physical and morphological blood parameters. Diagnostic significance of the leukogram. Leukocytosis, leukopenia, and their clinical significance. **Topic 22.** Biochemical blood examination. Clinical cases: analysis of blood parameters in various animal pathologies.		
Lectures 21-22	Attendance and participation	
Laboratory Class 16.	Collect blood samples from different animal species and understand storage requirements.	10
Laboratory Class 17.	Determine erythrocyte counts and interpret clinical significance.	10
Laboratory Class 18.	Determine leukocyte counts and interpret clinical significance.	10
Laboratory Class 19.	Prepare, fix, and stain blood smears using different staining techniques.	10
Laboratory Class 20.	Analyze leukograms and interpret leukocyte changes.	10
Laboratory Class 21.	Perform biochemical blood analysis and interpret findings.	10
Independent Study 4	Blood collection and hematological examination in poultry.	10

Module Examination		30
Total for Module 6		**100**
Topic 23. Generalization of the study of the discipline "Clinical Diagnosis of Animal Diseases." Logic of establishing a diagnosis based on acquired knowledge, practical skills, and competencies. Clinical history of a patient (based on clinical case examples).		
Lecture 23	Attendance and participation	-
Study work for Semester 2		$(M_3+M_4+M_5+M_6)/4*0,7$ <70
Examination		**30**
Total for the course	**Coursework + examination <100**	
Coursework		**100**

8.2. Scale for assessing student's knowledge

Student's rating, points	National grading (exam/credits)
90-100	excellent
74-89	good
60-73	satisfactory
0-59	unsatisfactory

8.3. Assessment policy

Deadlines and exam retaking rules	*EXAMPLE:* works that are submitted late without valid reasons will be assessed with a lower grade. Module tests may be retaken with the permission of the lecturer if there are valid reasons (e.g. a sick leave).
Academic integrity rules	*EXAMPLE:* cheating during tests and exams is prohibited (including using mobile devices). Term papers and essays must have correct references to the literature used
Attendance rules	*EXAMPLE:* Attendance is compulsory. For good reasons (e.g. illness, international internship), training can take place individually (online by the faculty dean's consent)

9. Teaching and learning sources:

- electronic training course of the academic discipline (on the educational portal of the NUBiP of Ukraine eLearn:

https://elearn.nubip.edu.ua/course/view.php?id=5307

Lecture notes, presentations (in electronic form)

Textbooks, manuals, workshops:

1. Clinical diagnosis of animal diseases: Manual / M.I. Tsvilikhovskii, O.M. Yakymchuk, M.O. Maryniuk, A.O. Zemlianskyi. Kyiv : NUBiP Ukraine, 2024. 340 p.

2. Tymoshenko O.P., Zemlianskyi A.O. «Lipid metabolism in internal pathology of dogs» Kyiv, KOMPRINT Publishing House, 2024 – 183 p.

3. Morozenko, D., Dotsenko, R., Vashchyk, Y., Zakhariev, A., Zemlianskyi, A., Seliukova, N., & Dotsenko, E. (2021). Biochemical markers of connective tissue metabolism in the diagnostics of respiratory diseases in human and animals: retrospective analysis (1984–2010). ScienceRise: Biological Science, (4 (29)), 30-35

4. Dotsenko, R., Vashchyk, Y., Zakhariev, A., Zemlianskyi, A., Seliukova, N., Gliebova, K., & Kostyshyn, L. M. (2022). Prevalence of internal diseases of dogs and cats: a retrospective analysis (1994–2014). ScienceRise: Biological Science, (2 (31)), 8-12.

5. Dotsenko, R., Vashchyk, Y., Zakhariev, A., Zemlianskyi, A., Seliukova, N., Gliebova, K., & Kostyshyn, L. M. (2022). Prevalence of internal diseases of dogs and cats: a retrospective analysis (1994–2014). ScienceRise: Biological Science, (2 (31)), 8-12.

6. Morozenko, D., Dotsenko, R., Vashchyk, Y., Zakhariev, A., Zemlianskyi, A., Seliukova, N., ... & Kostyshyn, L. M. (2022). The role of connective tissue biopolymers in the pathogenesis of dog bronchopneunmonia and cat brochnial asthma. ScienceRise: Biological Science, (2 (31)), 13-17.

7. Biochemical parameters of blood in cats with cardiogenic arterial thromboembolism and acute heart failure Ukrainian Journal of Veterinary Sciences, 14(1), 74-89. doi: 10.31548/veterinary1.2023.74.

8. Tsvilikhovskyi M.I., Yakymchuk O.M., Maryniuk M.O., Yakymchuk I.M., Bondar V.O. Clinical diagnostics of animal diseases. Textbook. K.: "CP "Komprint", 2022. 387 p.

9. Tsvilikhovskyi M.I., Yakymchuk O.M., Maryniuk M.O., Bondar V.O., Yakymchuk I.M. Workshop on clinical diagnostics of animal diseases; edited by M.I. Tsvilikhovsky. K.: "TsP Komprint", 2019. 307 p.

10. Tsvilikhovskii M.I., Yakymchuk O.M., Maryniuk M.O., Yakymchuk I.M. Clinical study of animal organs and systems. Textbook. K., Komprint, 2023. 372 p.

11. Tsvilikhovskii M.I., Yakymchuk O.M., Maryniuk M.O., Zemlianskyi A.O. Clinical diagnosis of animal diseases: Manual . Kyiv : NUBiP Ukraine, 2024. 340 p.

12. Tsvilikhovskii M.I., Yakymchuk O.M., Bondar V.O., Maryniuk M.O., Obruch M.M., Yakymchuk I.M. Clinical study organs and systems of animals: a textbook. K., "TsP" KOMPRINT". 2017. 382 p.

13. Tsvilikhovsky M.I., Yakymchuk O.M., Marynyuk M.O., Bondar V.O., Yakymchuk I.M., Ivanchenko N.Yu. Clinical diagnostics of animal diseases. Part 1. Instrumental methods of studying the heart of animals: a textbook. K., "TsP" KOMPRINT". 2017. 126 p.

14. Clinical diagnostics of internal diseases of animals / Ed. V.I. Levchenko. Bila Tserkva. 2017. 544 p.

Methodological materials for studying the academic discipline

1. Tsvilikhovsky M.I., Yakymchuk O.M., Marynyuk M.O., Kostyuk O.S., Yakymchuk I.M. Modern methods of studying the heart. K., "TsP "KOMPRINT", 2020. 24 p.

2. Tsvilikhovskyi M.I., Yakymchuk O.M., Marynyuk M.O., Yakymchuk I.M. Diagnosis of diseases of the cardiovascular system. K., "Central Research Center "COMPRINT", 2020. 26 p.

3. Tsvilikhovskyi M.I., Yakymchuk O.M., Marynyuk M.O., Kostyuk O.S., Yakymchuk I.M. Modern electrocardiography of animals. K., "Central Research Center "COMPRINT", 2020. 22 p.

4. Tsvilikhovskyi M.I., Yakymchuk O.M., Marynyuk M.O., Yakymchuk I.M. Diagnosis of diseases of the respiratory system of animals. K., "Central Research Center "COMPRINT", 2020. 24 p.

5. Palyukh T.A., Nemova T.V., Pavelytsya O.O., Bereza V.I., Tsvilikhovsky M.I. Heart diseases of animals (in questions and answers). K.: "CP "COMPRINT", 2020. Boyko N.I., Nemova T.V. Laboratory equipment and features of blood sampling from different species of animals for hematological studies. Compprint, 2021. 21 p.

6. Boyko N.I., Nemova T.V., Boyko G.V. Counting the number of erythrocytes in different species of animals and their interpretation. Compprint, 2021. 19 p.
7. Boyko N.I., Nemova T.V., Drobot M.V. Counting the number of leukocytes in different species of animals and their interpretation, Compprint, 2021. 21 p.
8. Boyko N.I., Nemova T.V., Palyukh T.A. Counting the number of platelets in different species of animals and their interpretation. Compprint, 2021. 26 p.
9. Tsvilikhovsky M.I., Yakymchuk O.M., Marynyuk M.O., Yakymchuk I.M., Yakymchuk M.S. Clinical and laboratory changes in the body of dogs and cats with pathologies of the urinary system. K.: "Central Research Center "KOMPRINT", 2021. 42 p.
10. Tsvilikhovsky M.I., Yakymchuk O.M., Marynyuk M.O., Yakymchuk I.M. Changes in blood parameters of animals with pathologies. K.: "Central Research Center "KOMPRINT", 2022. 49 p.
11. Tsvilikhovsky M.I. Yakymchuk O.M., Marynyuk M.O., Yakymchuk I.M. Diagnosis of heart defects". Methodological instructions for performing laboratory and independent work on the discipline "Clinical diagnostics of animal diseases". K., Central Research Center "Komprint", 2023. 24p.
12. Tsvilikhovsky M.I., Yakymchuk O.M., Marynyuk M.O. "MICROSCOPIC RESEARCHES OF URINARY SEDIMENT OF ANIMALS". Methodological instructions for performing laboratory and independent work on the discipline "Clinical diagnostics of animal diseases". K., CP "Komprint", 2023. 40 p.
13. Nemova T.V., Palyukh T.A., Marynyuk M.O., Zemlyansky A.O. Diary for completing educational practice on the discipline "Clinical diagnostics of animal diseases" for 3rd year students of the OS "Master". K.: "CP "KOMPRINT", 2025. 38 p.
14. Nemova T.V., Palyukh T.A., Marynyuk M.O., Zemlyansky A.O. Methodological instructions for writing a course work on the discipline "Clinical diagnostics of animal diseases" for 3rd year students of the Master's degree program. Kyiv: "Comprint Publishing House", 2025. 36 p. Practice program: attached

10. Recommended sources of information

1. Golopura S.I., Tsvilikhovsky M.I. Metabolic disorders and colostral immunity in cattle and their correction: Monograph . K., CP "COMPRINT". 2021. 408 p.
2. Plysyuk V. M., Palyukh T. A., Tsvilikhovsky M.I. Diagnosis of cardiomyopathies in a domestic cat. Monograph. Kyiv., NUBiP of Ukraine, 2024. – 139 p.
3. Lokes-Krupka T.P., Tsvilikhovsky M.I., Zarytsky S.M. Clinical signs of hypothyroidism in domestic dogs. Scientific Bulletin of the Lviv National University of Veterinary Medicine and Biotechnology named after S.Z. Gzhytsky. Series: Veterinary Sciences. 2021, T. 22. No. 99. P. 80-83.
4. Koshchavka M.M., Boyko N.I., Tsvilikhovsky M.I. Results of morphological study of blood of cows during heat shock depending on the stages of temperature-humidity index. Scientific reports of NUBiP of Ukraine, 2020. No. 6 (88).
5. Lokes-krupka T. P., Tsvilikhovsky M. I., Kanivets N. S., Kravchenko S. O., Burda T. L. Structural changes in the internal organs of domestic cats and dogs in case of obesity caused by diabetes mellitus // Bulletin of Poltava DAA. - 2020. - No. 2(97). - P.194-202.

6. Sirenko R.P., Tsvilikhovsky M.I. Multicenter retrospective study on the prevalence of idiopathic cystitis in domestic cats in a megalopolis. Scientific Veterinary Bulletin. 2021. Issue 2. P.126-135.

7. Kaziev Zh., Golopura S., Tsvilikhovsky M., Boyko N. Ushkalov A. Diagnostic studies for enterotoxemia in rabbits Ukrainian Journal of Veterinary Sciences", Vol. 15, No. 3, 2024 https://doi.org/10.31548/veterinary3.2024.94

8. Tretyakova K. M., Nemova T. V., Solomon V. V., Ishchenko V. D. Preclinical studies of the phytocomplex Atoxvet. Monografia pokonferencejna. Science, research, development No. 37. Warszawa, 2021. pp. 54-60.

9. Holopura S., Boiko N., Nemova T., & Tsvilikhovskiy M. Impact of stress on the body of service dogs and alleviation methods: Literature overview. Scientific Reports of the National University of Life and Environmental Sciences of Ukraine, 2024, 20(6), 138-150. doi: 10.31548/dopovidi/6.2024.138

10. Farafonov S., Yaremko O., Verkholiuk M., Muzyka L., Gutyj B., Marenkov O., Lykhach V., Nemova T., Khmelova O., Mylostyvyi R. Determining Trace Elements in the Hair of Beef Cattle as a Non-Invasive Method for Assessing Mineral Metabolism. Journal of Animal Health and Production. 2024, Vol. 12, Sp. Iss. 1, P. 332-337.