MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
SUMY NATIONAL AGRARIAN UNIVERSITY
Faculty of Veterinary Medicine
Department of Virology, Pathology and Poultry Diseases. prof. II Panikar

MODULE SYLLABUS

Cytology, histology, embryology

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Implemented within the educational program "Veterinary Medicine"

in specialty 211 "Veterinary Medicine"

at the second (master's) level of higher education

Sumy-2021

Author: _____ Panasenko O. , Ph D., Associate Professor
(signature) (surname, initials) (academic degree and title, position)

Considered, approved and approved at the meeting of the department virology, pathoanatomy and diseases of poultry prof. Panikara II	protocol from 8.06.2021 № 12
	The head departments _____ P. Petrov (signature) (surname, initials)

Approved by:

Guarantor of the Academic program _____ (L. Ulko)

Dean of the Faculty _____ (O. Nechyporenko)

Syllabus review (attached) is provided by : Kasianenko _____

_____

Representative of the Department of Education Quality assurance, licensing and accreditation

_____ (_____)

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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 educational program

1. MODULE OVERVIEW

<table>
<tr><td>1.</td><td>Title</td><td colspan="4">OK 13. Cytology, histology, embryology</td></tr>
<tr><td>2.</td><td>Faculty/Department</td><td colspan="4">Veterinary medicine / virology, pathoanatomy and poultry diseases. prof. Panikara II</td></tr>
<tr><td>3.</td><td>Type (obligatory or optional)</td><td colspan="4">Obligatory</td></tr>
<tr><td>4.</td><td>Program(s) to which module is attached</td><td colspan="4">Veterinary medicine / 211 Veterinary medicine</td></tr>
<tr><td>5.</td><td>Level of the National Qualifications Framework</td><td colspan="4">-</td></tr>
<tr><td>6.</td><td>Semester and duration of module</td><td colspan="4">NRC of Ukraine - level 7, QF-EHEA - second cycle, EQF-LLL - level 7</td></tr>
<tr><td>7.</td><td>ECTS credits number</td><td colspan="4">2-3 semester, 15 + 15 weeks</td></tr>
<tr><td>8.</td><td>Total workload and time allotment</td><td colspan="4">5.0</td></tr>
<tr><td rowspan="3">9.</td><td>The total number of hours and their distribution Language of instruction</td><td colspan="3">Contact work (classes)</td><td>Individual work</td></tr>
<tr><td></td><td>Lectures</td><td>Practical / seminar</td><td>Laboratory</td><td></td></tr>
<tr><td></td><td>14
16</td><td></td><td>16
14</td><td>30
60</td></tr>
<tr><td>10.</td><td>Module leader</td><td colspan="4">English</td></tr>
<tr><td>11.</td><td rowspan="2">Module leader contact information</td><td colspan="4">Panasenko Alexander Sergeevich</td></tr>
<tr><td>11.1</td><td colspan="4">mob. tel. +380667103234, e-mail-alpanas@ukr.net</td></tr>
<tr><td>12.</td><td>Module description</td><td colspan="4">"Cytology, histology, embryology" is the basis for training, studying not only the tissues but also the cells of which they are composed, as well as the structure of organs and systems of the body. The subject of study of the discipline is the microscopic and ultramicroscopic structure of cells, tissues and organs of the animal body. The study of the course "Cytology, histology, embryology" is an analysis of the structure and development of the animal at the subcellular, cellular, tissue levels, and taking into account the histological structure - at the level of organ structure. Knowledge of submicroscopic and microscopic structures of organs in connection with different conditions of an organism is basic for veterinarians at research of morphological changes of bodies in the conditions of pathology at treatment of animals.</td></tr>
<tr><td>13.</td><td>Module aim</td><td colspan="4">The purpose of the educational component is to form in higher education competencies the use of the ability to establish the structure and functioning of cells, tissues, organs, their systems and apparatus of animals, understanding the structure of organs, their systems and apparatus and the whole organism in general submicroscopic levels, functions, topography, determination of species and age of organs, their systems and devices. The student must know the importance of cytology, histology and embryology for veterinary medicine, the structure and function of</td></tr>
</table>

		somatic and germ cells and their development, the structure, function and sources of development of tissues and organs, their devices and systems. Must be able to use a light microscope, select material for histological examination, record it,
14.	Module Dependencies (prerequisites, co-requisites, incompatible modules)	The educational component, as a basis for clinical subjects, is based on the foundation of general theoretical disciplines: zoology, microbiology, anatomy and physiology of humans and animals, plant physiology, genetics, molecular biology, biology of individual development and integrates with these disciplines; this involves the formation of skills to apply the acquired knowledge and practical skills from the course in the process of further study and in future professional activities.
15.	The policy of academic integrity	Applicants are explained the value of acquiring new knowledge; value and functions of academic integrity; report the inadmissibility of plagiarism, encourage independent performance of educational tasks, correct reference to sources of information in the case of borrowing scientific materials. Write-offs during tests and exams are prohibited (including the use of mobile devices). Written works must have correct textual references to the used literature. 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 (writing off, cheating, publishing someone's work for their own) - cancellation of points; re-evaluation of re-execution of non-independently performed work with new source data; Use of electronic devices during the final control of knowledge - removal from work, grade 0, re-passing the final control

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 1	**How assessed**
MLOs 1. Know the components of the discipline and research methods. Know the stages of manufacture of histopreparations, the structure of the light microscope and the rules of working with it. Use a light microscope to analyze cytological and histological specimens. Know the basic modern provisions of cell theory and the basics of chemical composition and structure of cells. Analyze intracellular structures on electrograms. Know the components of eukaryotic cells and their functional features. Differentiate cell components on histopreparations and electrograms. Know the	+	– Oral control (participation in a discussion on the topic of the lecture) – Written control (performance of tasks on independent work, independent study of the topic as a whole or individual issues of independent work (test results, preparation of presentations, presentation report of self-developed material)) – Laboratory-practical control (performance of tasks on laboratory works)

manifestations of cell life. Differentiate, using a light microscope, on histopreparations methods of cell proliferation.		
MLOs 2. Know the structure and function of germ cells. Know the periods of development of male and female gametes, stages of fertilization and the main periods of embryogenesis of domestic animals. Differentiate varieties of blastulas and gastrula with the help of a light microscope on histopreparations. Know the structures of animals and embryonic leaves and axial organs from which they develop and the main stages of embryogenesis. Differentiate embryonic leaves and axial organs with the help of a light microscope on histopreparations. Know the main stages of embryogenesis of birds and mammals, periods of their embryonic development. Differentiate the extraembryonic organs of mammals and birds on histo- and macropreparations.	+	– Oral control (participation in a discussion on the topic of the lecture) – Written control (performance of tasks on independent work, independent study of the topic as a whole or individual issues of independent work (test results, preparation of presentations, presentation report of self-developed material)) – Laboratory-practical control (performance of tasks on laboratory works)
MLOs 3. Know the modern basics of structure, classification of tissues and sources of their development, as well as classification and morphofunctional features of epithelial tissue. Differentiate types of epithelial tissue on histopreparations. Know the features of the structure and function of connective tissue and its classification. Know the components of the tissues of the internal environment and their functional features. Differentiate blood cells of amphibians, fish, birds and mammals on preparations-imprints. Know the tissues that are part of the actual connective tissue and their structure and function. Differentiate between loose and dense fibrous connective tissues and varieties of the latter, as well as fabrics with special properties.	+	– Oral control (participation in a discussion on the topic of the lecture) – Written control (performance of tasks on independent work, independent study of the topic as a whole or individual issues of independent work (test results, preparation of presentations, presentation report of self-developed material)) – Laboratory-practical control (performance of tasks on laboratory works)
MLOs 4. Know the features of the structure and function and classification of skeletal and muscular tissues. Differentiate on histopreparations types of bone and cartilage tissue, cardiac, skeletal and smooth muscle tissue. Know the components of nervous tissue, features of their structure and function and classification of nerve cells and neuroglia. Differentiate nerve cells, nerve fibers and endings and neuroglia cells.	+	– Oral control (participation in a discussion on the topic of the lecture) – Written control (performance of tasks on independent work, independent study of the topic as a whole or individual issues of independent work (test results, preparation of presentations, presentation report of self-developed material)) – Laboratory-practical control (performance of tasks on laboratory works)
MLOs 5. Know the patterns of structure of tubular and parenchymal organs, the composition of the cardiovascular system, development, structure and function of the heart, blood and lymphatic vessels.	+	– Oral control (participation in a discussion on the topic of the lecture) – Written control (performance of tasks on independent work, independent study of the topic as a whole or

Differentiate the heart, types of arteries, veins and microcirculatory vessels. Know the composition and general characteristics of the lymphatic system, classification of hematopoietic organs and immune defense, their development, structure and function. Differentiate central, peripheral organs of hematopoiesis and immune protection and endocrine glands. Know the general characteristics, classification of organs of the endocrine system and features of their structure and function.		individual issues of independent work (test results, preparation of presentations, presentation report of self-developed material)) – Laboratory-practical control (performance of tasks on laboratory works)
MLOs 6. Know the composition of the general body, function, structure and development of the skin and its derivatives. Differentiate the skin, its glandular and horny derivatives. Know the composition of the main, anterior, middle and hindgut, features of development, structure and function of its organs. On histopreparations to differentiate components and stages of development of teeth, mechanical and taste papillae of the tongue and types of wall salivary glands, esophagus, single-chamber and multi-chamber stomachs, small and large intestine and wall digestive glands. Know the general characteristics and composition of the respiratory system, their features of structure and development. Using a light microscope, differentiate the components of the airways and respiratory lungs on histopreparations. Distinguish on electrograms of cells of a wall of alveoluses. Know the functions and composition of the urinary system, their structure and development, histophysiology of urine formation, endocrine complex of kidneys. Differentiate the organs of the urinary system.	+	– Oral control (participation in a discussion on the topic of the lecture) – Written control (performance of tasks on independent work, independent study of the topic as a whole or individual issues of independent work (test results, preparation of presentations, presentation report of self-developed material)) – Laboratory-practical control (performance of tasks on laboratory works)
MLOs 7. Know the composition and functions of the male reproductive system, the structure of the testicles, vas deferens, additional gonads and penis. Know the composition and functions of the female reproductive system, the structure of the ovaries and genital tract. Using a light microscope, differentiate the male and female reproductive organs on histopreparations. Know the general characteristics, classification, development and structure of the nervous system. Differentiate the brain and spinal cord, nerve nodes and nerves. Know the general characteristics of analyzers and their composition, sense organs, their classification, development and structure of the organ of vision, its protective and auxiliary organs. Differentiate the membranes of the eyeball and their layers on histopreparations. Know the general characteristics of analyzers and their composition, sense organs,	+	– Oral control (participation in a discussion on the topic of the lecture) – Written control (performance of tasks on independent work, independent study of the topic as a whole or individual issues of independent work (test results, preparation of presentations, presentation report of self-developed material)) – Laboratory-practical control (performance of tasks on laboratory works) – Final control (solving tests)

their classification, development and structure of the parietal-curly organ (organ of hearing and balance). Be able, with the help of a light microscope, to differentiate the spiral organ and its constituent elements on histopreparations.		

3. MODULE INDICATIVE CONTENT

Topic. List of issues to be addressed within the topic	Distribution within the total time budget				Recommended Books[1]
	Classroom work			Individual work	
	Luke	P.z / semin. with	Lab. with.		
2rd semester					
Topic 1. Cytology as a science. • Cytology, histology, embryology, their content and connection with other biological sciences. Significance for veterinary medicine. • History of development of cytology, embryology, histology, their formation as a science. • The concept of the cell as a living elementary self-regulating multilevel system of the whole organism.	2		2	2	[1, 7, 14, 17]
Topic 2. The value of embryology. • Applied significance of embryology. Relationship between individual and historical development of the organism. • Modern tasks and prospects of development • Cell theory, its authors • Research methods in histology				4	[1, 10, 12, 16]
Topic 3-4. Reproduction of cells. Cell activity. • Methods of cell division. • Mitosis, mitotic cycle: interphase, prophase, metaphase, anaphase, telophase. • The structure of mitotic chromosomes, the concept of karyotype. • Types of cell cycles. • Intracellular mechanisms of cell cycle regulation.	2		2	2	[3, 5, 14, 17, 21]
Topic 5. Progenesis. Gamete structure. • Structure and functions of germ cells • Male gametes are a micro- and			2	2	[4, 8, 13, 16, 25]

[1] Specific source from the main or additional recommended literature

submicroscopic structure. Biological properties • Oocytes - types, structure, biological properties • Gametogenesis - the development of male and female gametes					
Topic 6. The concept of tissue. Epithelial tissue • General characteristics of tissues, their meaning, types • Tissue classification • Theories of tissue origin • Epithelial tissues: general characteristics of epithelium, their morphological and ontophylogenetic classification, distribution in the body, structure and functional significance of the integumentary epithelium.				4	[2, 5, 9, 15, 27]
Topic 7-8. Connective tissues (tissues of the internal environment). Trophic group of tissues. • General characteristics and classification. • Blood, its components, importance in the body. • Classification, structure and significance of leukocytes. • The concept of leukocyte formula. • Features of the structure of blood cells. • Lymph, its constituent components, meaning.	2		2	2	[1, 3, 9, 13, 28]
Topic 9-10. Connective tissues (tissues of the internal environment). Connective tissues with special functions. • General principles of connective tissue structure • Classification of connective tissues • Adipose, pigmented, mucous tissue, endothelium. • Dense collagen and elastic connective tissue. • Cartilaginous tissues.	2		2	2	[1, 6, 11, 17, 26]
Topic 11. Connective tissues (tissues of the internal environment). Support group of tissues. • Bone tissue: development, structure, functions and classification. • Coarse fibrous bone tissue. • Lamellar bone tissue • The role of connective tissues in animals	2		2	2	[3, 9, 12, 15, 22]

Topic 12. Muscle tissue. • General characteristics and classification of muscle tissues. • Smooth muscle tissue, its structure and development • Cross-striped muscle tissue, its structure and development • Cardiac muscle tissue	2		2	2	[1, 6, 8, 16, 21]
Topic 13. Nervous tissue. • Development and general structure of nervous tissue. • Structure of neurons and their classification • Nerve fibers, types, structure, functional features, regeneration				2	[1, 3, 8, 12, 20]
Topic 14. Introduction to special histology. • The concept of the body. • General patterns of structure of tubular and parenchymal organs.	2		2	2	[3, 8, 12, 18, 20]
Total	14		16	30	
3th semester					
Topic 1 Nervous system • The role of the nervous system in the vital functions of the organism and ensuring its integrity. • Embryogenesis of the nervous system. • Mophological and functional division of the nervous system • Central nervous system: the structure of the brain and spinal cord • Microscopic structure and functions of the cerebellum, spinal ganglia • Meninges	4		2	10	[1, 4, 10, 14, 23]
Topic 2. Cardiovascular system • The value of the cardiovascular system and its components • Arteries, their types and structure • Veins, their classification and structure • The structure of the heart wall, the conduction system of the heart	2		2	8	[2, 8, 14, 16, 24]
Topic 3. Hematopoietic organs and immune defense • General structural and functional characteristics of hematopoietic organs • Central organs of the hematopoietic system • Peripheral hematopoietic organs: lymph nodes, spleen, lymphoid formations • The role of lymphocytes in the development of immune responses	2		2	8	[1, 6, 13, 18, 22]

Topic 4. Endocrine system • General morphological and functional characteristics of the central endocrine organs: hypothalamic nuclei; pituitary and pineal gland • Peripheral endocrine organs. Development, structure and function of the thyroid, thyroid and adrenal glands • Dissociated endocrine system	2		2	8	[2, 7, 15, 19, 27]
Topic 5. General morphofunctional characteristics of the digestive system • Embryogenesis of the digestive system • Diagram of the structure of the digestive tract, mucous membrane • Oropharyngeal organs: lips, cheeks, tongue, teeth, etc. • Histological structure of the esophagus. The structure of the single-chamber stomach, small and large intestine	2		2	8	[3, 9, 12, 17, 28]
Topic 6. Respiratory organs • Development and functions of the respiratory system • Airways. The structure of the mucous membrane of different parts of the nasal cavity • The structure of the larynx, trachea, bronchi and terminal bronchioles • Respiratory lungs • Airtight barrier • Structure and functions of the pleura	2		2	8	[1, 5, 16, 19, 26]
Topic 7. Urinary organs. Reproductive system • General morphofunctional characteristics of urinary organs • The structure of the kidneys and their blood vessels • Ultrastructural characteristics of the nephron • Urinary tract, bladder and urethra • Endocrine complex of the kidney • Significance and embryonic development of male genitals • The structure of the testicle (testis) • Female genitals, significance and embryogenesis • The structure of the ovary • Endocrine function of the genital system • The structure of the fallopian tube, uterus, vagina, genitourinary tract, cyclic changes in the genitals of females	2		2	10	[2, 7, 12, 16, 24]
Total	16		14	60	

4. TEACHING AND LEARNING METHODS

MLOs	**Teaching methods** (work to be carried out by the teacher during classes, consultations)	**Number of hours**	**Teaching methods** (what types of educational activities the student must perform independently)	Number of hours
MLOs 1	Survey of students with explanation of key questions of the subject, answers to students' questions, mastery of practical skills, methods of laboratory work. Interactive discussion of the topic in the form of a discussion, including information presented in diagrams and figures, description of histopreparation, demonstration of separate morphological structures in the provided histopreparations and photos. Solving situational problems that have a clinical focus and are based on knowledge and ability to interpret morpho-functional connections in animals	12	Independent processing of materials on the topic. Memorization of theoretical material, observation. On the basis of the studied and processed material Fr.preparation of a synopsis of independent work; registration of independent work with histological preparation in the form of the protocol. Acquaintance with the information of official sites on a subject of employment or a separate question.	12
MLOs 2	Survey of students with explanation of key questions of the subject, answers to students' questions, mastery of practical skills, methods of laboratory work. Interactive discussion of the topic in the form of a discussion, including information presented in diagrams and figures, description of histopreparation, demonstration of separate morphological structures in the provided histopreparations and photos. Solving situational problems that have a clinical focus and are based on knowledge and ability to interpret morpho-functional connections in animals	14	Independent processing of materials on the topic. Memorization of theoretical material, observation. On the basis of the studied and processed material Fr.drawing up a synopsis of independent work Elaboration of the relevant sections of the autopsy protocol (according to the real case); drawing up a pathological-anatomical diagnosis, registration of a clinical-pathological-anatomical epicrisis about the case Acquaintance with the information of official sites on a subject of employment or a separate question.	14
MLOs 3	Survey of students with explanation of key questions of the subject, answers to students' questions, mastery of	16	Independent processing of materials on the topic. Memorization of theoretical material, observation.	16

	practical skills, methods of laboratory work. Interactive discussion of the topic in the form of a discussion, including information presented in diagrams and figures, description of histopreparation, demonstration of separate morphological structures in the provided histopreparations and photos. Solving situational problems that have a clinical focus and are based on knowledge and ability to interpret morpho-functional connections in animals		On the basis of the studied and processed material Fr.drawing up a synopsis of independent work Elaboration of the relevant sections of the autopsy protocol (according to the real case); drawing up a pathological-anatomical diagnosis, registration of a clinical-pathological-anatomical epicrisis about the case Acquaintance with the information of official sites on a subject of employment or a separate question.	
MLOs 4	Survey of students with explanation of key questions of the subject, answers to students' questions, mastery of practical skills, methods of laboratory work. Interactive discussion of the topic in the form of a discussion, including information presented in diagrams and figures, description of histopreparation, demonstration of separate morphological structures in the provided histopreparations and photos. Solving situational problems that have a clinical focus and are based on knowledge and ability to interpret morpho-functional connections in animals	18	Independent processing of materials on the topic. Memorization of theoretical material, observation. On the basis of the studied and processed material Fr.drawing up a synopsis of independent work Elaboration of the relevant sections of the autopsy protocol (according to the real case); drawing up a pathological-anatomical diagnosis, registration of a clinical-pathological-anatomical epicrisis about the case Acquaintance with the information of official sites on a subject of employment or a separate question.	18
MLOs 5	Survey of students with explanation of key questions of the subject, answers to students' questions, mastery of practical skills, methods of laboratory work. Interactive discussion of the topic in the form of a discussion, including information presented in diagrams and figures, description of histopreparation, demonstration of separate	18	Independent processing of materials on the topic. Memorization of theoretical material, observation. On the basis of the studied and processed material Fr.drawing up a synopsis of independent work Elaboration of the relevant sections of the autopsy protocol (according to the real case); drawing up a pathological-anatomical diagnosis, registration of a	18

	morphological structures in the provided histopreparations and photos. Solving situational problems that have a clinical focus and are based on knowledge and ability to interpret morpho-functional connections in animals		clinical-pathological-anatomical epicrisis about the case Acquaintance with the information of official sites on a subject of employment or a separate question.	
MLOs 6	Survey of students with explanation of key questions of the subject, answers to students' questions, mastery of practical skills, methods of laboratory work. Interactive discussion of the topic in the form of a discussion, including information presented in diagrams and figures, description of histopreparation, demonstration of separate morphological structures in the provided histopreparations and photos. Solving situational problems that have a clinical focus and are based on knowledge and ability to interpret morpho-functional connections in animals	20	Independent processing of materials on the topic. Memorization of theoretical material, observation. On the basis of the studied and processed material Fr.drawing up a synopsis of independent work Elaboration of the relevant sections of the autopsy protocol (according to the real case); drawing up a pathological-anatomical diagnosis, registration of a clinical-pathological-anatomical epicrisis about the case Acquaintance with the information of official sites on a subject of employment or a separate question.	20
MLOs 7	Survey of students with explanation of key questions of the subject, answers to students' questions, mastery of practical skills, methods of laboratory work. Interactive discussion of the topic in the form of a discussion, including information presented in diagrams and figures, description of histopreparation, demonstration of separate morphological structures in the provided histopreparations and photos. Solving situational problems that have a clinical	22	Independent processing of materials on the topic. Memorization of theoretical material, observation. On the basis of the studied and processed material Fr.drawing up a synopsis of independent work Elaboration of the relevant sections of the autopsy protocol (according to the real case); drawing up a pathological-anatomical diagnosis, registration of a clinical-pathological-anatomical epicrisis about the case Acquaintance with the	22

	focus and are based on knowledge and ability to interpret morpho-functional connections in animals		information of official sites on a subject of employment or a separate question.	

5. ASSESSMENT

5.1. Diagnostic assessment

5.2. Summative assessment

5.2.1. Intended learning outcomes methods:

№	Methods of summative evaluation	Points / Weight in the overall score	Date of compilation
1.	Oral control (participation in a discussion on the topic of the lecture)	*40 points / 40%*	Weekly
2.	Written control (performance of tasks on independent work)	*15 points / 15%*	According to the schedule
3.	Laboratory-practical control (performance of tasks on laboratory works)	*30 points / 30%*	According to the schedule of the hospital
4.	Final control (solving tests)	*15 points / 15%*	According to the schedule of delivery of modules

5.2.2. Grading criteria

Component[2]	**Unsatisfactorily**	**Satisfactorily**	**Okay**	**Perfectly**[3]
	<14 points	*15-24 points*	*25-34 points*	*35-40 points*
Thematic survey. Oral control	The student can play only individual fragments of the course.	The student has certain knowledge provided in the program of the discipline, has the basic provisions studied at a level that is defined as the minimum allowable	The student in general is well versed in the material, knows the basic provisions of the material, makes an analysis of possible situations based on them and is able to apply in solving typical practical problems, but admits some inaccuracies	The student demonstrates complete and solid knowledge of the educational material in the amount that corresponds to the program of the discipline, correctly and reasonably makes the necessary decisions in various non-standard situations.
	<9 points	*10-19*	*20-29 points*	*30 points*
Laboratory-practical control (performance of tasks on laboratory works) Solution of situational tasks	The student is not prepared to solve problems, the answer is incomplete, some components are missing or insufficient to disclose	Most requirements are met, but some components are missing or insufficiently disclosed, there is no analysis of other approaches to the issue	The student has mastered the basic material, and understands the solution of problems, has suggestions on the direction of their solutions. All the	The task is performed methodically correctly and qualitatively. The student is able to implement the theoretical provisions of the

[2] Indicate the component of summative assessment

[3] Indicate the distribution of points and the criteria that determine the level of evaluation

		Using the basic theoretical provisions, the student has difficulty performing the task. Tasks are significantly formalized: there is a correspondence of the algorithm, but there is no deep understanding of the work	requirements of the task are met, but in violation of the methods	discipline in practice When performing tasks, he showed the ability to solve tasks independently
	<5 points	*5-8*	*8-14 points*	*15 points*
Written control (performance of tasks on independent work). Protection of the abstract from independent work	The student does not have a complete understanding of the material on the discipline. The student is not prepared to independently solve problems that outline the purpose and objectives of the discipline	Despite the fact that the student completed the program of the discipline, he worked passively, his answers during the registration of works are mostly incorrect, unfounded	Knows the characteristics of the main provisions that are crucial in performance of registration of tasks and explanation of the accepted decisions, within the discipline studied. Errors in the answers are not systemic.	When performing tasks, he showed the ability to solve tasks independently. The synopsis is designed flawlessly, logically arranged material with an understanding of the relationships of the processes disclosed on this topic.
Multiple choice tests	The student gives the correct answer to several questions (≤ 33% of the correct answers).	The student has some knowledge provided in the program of the discipline, has the basic provisions being studied and gives the correct answer to several questions (34-59% of correct answers).	The student is generally well versed in the material, knows the basic provisions of the material, and gives the correct answer to several questions (60-89% of the correct answers).	The student demonstrates complete and solid knowledge of the study material in the amount that corresponds to the program of the discipline, correctly answers the test questions (90-100% of correct answers).

5.1.Formative assessment:

To assess current progress in learning and understanding areas for further improvement

№	Elements of formative assessment	Date
1	Oral interview of students with explanation of key questions of the subject, answers to students' questions, mastery of practical skills (methods of laboratory work)	During the lesson
2	Oral feedback from the teacher while working on thesolution of clinical and situational problems	During the lesson
3	Written feedback from the teacher after checking the synopsis with independent study of the discipline.	Within a week, after execution

6. LEARNING RESOURCES (LITERATURE)

6.1. The main sources

6.1.1. Textbooks guide

1. Goralsky LP and others. Histology of domestic animals: textbook. manual. Zhytomyr: ZhNAEU, 2020. 296 p.
2. Novak VP, Bichkov YP, Pilipenko M.Yu. Cytology, histology, embryology: textbook. manual. K .: Dakor, 2008. 522 s.
3. Novak VP, Pilipenko M.Yu., Bichkov Yu.P. Cytology, histology, embryology: textbook. manual. K .: VIRA-R, 2001. 288 p.
4. Khomich VT Lectures on cytology, embryology and histology of domestic animals. K: AgrarMediaGroup, 2012. 296 p.
5. Novak VP, Melnichenko AP, Bevz OS Workshop on laboratory-practical classes in cytology, embryology and general histology for students of the faculties of veterinary medicine and biological technology. Bila Tserkva, 2006. 57 p.
6. Lutsyk OD, Tchaikovsky YB Histology. Cytology. Embryology: a textbook. Vinnytsia: Nova Kniga, 2018. 592 p

6.1.2. Methodical support

7. Panikar II, Garkova VV Cytology, histology, embryology: Guidelines for laboratory classes. Sumy, 2006. 68p.
8. Zon GA, Garkava VV Cytology, histology, embryology: Fundamentals of cytology: Guidelines for conducting laboratory classes. Sumy, 2010. 32p.
9. Garkava VV, Baidevlyatova Yu.V. Cytology, histology, embryology: Fundamentals of embryology: Guidelines for conducting laboratory classes. Sumy, 2011. 34p.
10. Garkava VV, Baidevlyatova Yu.V. Cytology, histology, embryology: Tissues of the internal environment. Blood: Methodical instructions for conducting laboratory classes. Sumy, 2012. 28p.
11. Zon GA, Garkava VV Cytology, histology, embryology: Muscle tissue: Guidelines for laboratory classes. Sumy, 2011. 28p.
12. Zon GA, Garkava VV, Baidevlyatova Yu.V. Cytology, histology, embryology: Nervous system: Guidelines for laboratory classes. Sumy, 2012. 48p.
13. Zon GA, Garkava VV, Baidevlyatova Yu.V. Cytology, histology, embryology: Nervous tissue: Guidelines for laboratory classes. Sumy, 2011. 24p.
14. Panikar II, Garagulya GI, Garkova VV Cytology, histology, embryology: Hematopoietic organs and immune defense. Sumy, 2012. 46p.
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6.1.3. Other sources

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6.3.Software

Lectures are held in classrooms equipped with multimedia tools and involve the use of presentations.

Light microscopes, histopreparations, atlases, models, multimedia projector, interactive whiteboard.

Додаток

Рецензія на Робочу програму (силабус)

Параметр, за яким оцінюється робоча програма (силабус) освітнього компонента гарантом або членом проєктної групи	**Так**	**Ні**	**Коментар**
Результати навчання за освітнім компонентом (ДРН) відповідають НРК	+		
Результати навчання за освітнім компонентом (ДРН) відповідають передбаченим ПРН (для обов'язкових ОК)	+		
Результати навчання за освітнім компонентом дають можливість виміряти та оцінити рівень їх досягнення	+		

Член проектної групи ОП _____ _____

Параметр, за яким оцінюється робоча програма (силабус) освітнього компонента викладачем відповідної кафедри	**Так**	**Ні**	**Коментар**
Загальна інформація про освітній компонент є достатньою	+		
Результати навчання за освітнім компонентом (ДРН) відповідають НРК	+		
Результати навчання за освітнім компонентом (ДРН) дають можливість виміряти та оцінити рівень їх досягнення	+		
Результати навчання (ДРН) стосуються компетентностей студентів, а не змісту дисципліни (містять знання, уміння, навички, а не теми навчальної програми дисципліни)	+		
Зміст ОК сформовано відповідно до структурно-логічної схеми	+		
Навчальна активність (методи викладання та навчання) дає змогу студентам досягти очікуваних результатів навчання (ДРН)	+		
Освітній компонент передбачає навчання через дослідження, що є доцільним та достатнім для відповідного рівня вищої освіти	+		
Стратегія оцінювання в межах освітнього компонента відповідає політиці Університету/факультету	+		
Передбачені методи оцінювання дозволяють оцінити ступінь досягнення результатів навчання за освітнім компонентом	+		
Навантаження студентів є адекватним обсягу освітнього компонента	+		
Рекомендовані навчальні ресурси є достатніми для досягнення результатів навчання (ДРН)	+		
Література є актуальною	+		

Рецензент (викладач кафедри) _____ _____ _____

(назва) (посада, ПІБ) (підпис)