SYLLABUS OF THE EDUCATIONAL COMPONENT

BIOCHEMICAL RESEARCH METHODS IN VETERINARY MEDICINE

Specialty	**211 Veterinary Medicine**	**mandatory discipline**	**selective**
Educational program	**Veterinary Medicine**	**Faculty**	**Veterinary Medicine**
educational level	**Not limited**	**Department**	**Animal Physiology and Biochemistry**

TEACHER

Hladka Nataliia

Higher education - veterinary medicine
Scientific degree – PhD in Agriculture, specialty 03.00.04 - biochemistry.
Academic title - associate professor
Work experience - more than 15 years

Indicators of professional activity by course topic:

- author of more than 5 methodological developments;
- more than 15 years of experience in scientific work;
- co-author of the workshop on biological chemistry;
- co-author of more than 2 thematic publications;
- participant of scientific and methodical conferences.

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The following are involved in the teaching of the discipline: associate professor, PhD in Agriculture Vita Prykhodchenko.

GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT (DISCIPLINE)

Purpose	assimilation by students of modern chemical and instrumental methods of substance analysis and their application to solving specific practical problems, mastering the general methodology of analysis and methods that play an important role in practical activities. The study of biochemical research methods is an important stage of a student's general chemical preparation. Provides the necessary base of knowledge and practical skills that will allow in the future to master new methods and devices in case of changes in methods and objects of analysis.
Format	lectures, practical classes, independent work, individual tasks.
Detailing of learning results and forms of their control	• Ability to use tools, special devices, devices, laboratory equipment and other technical means to carry out the necessary manipulations during professional activities (GC2, GC3, PC2, PLO1)/ individual practical classes. • Ability to follow the rules of labor protection, asepsis and antiseptics during professional activity. Ability to organize and conduct laboratory and special diagnostic studies and analyze their results (GC9, PC7, PLO3)/ individual practical classes. • Ability to abstract thinking, analysis, synthesis, search, processing of information from various sources (GC1, PLO18, PLO20)/ individual practical classes.
Scope and forms of control	3 ECTS credits (90 hours): 14 hours of lectures, 30 hours of practical classes, 46 hours of independent work; modular control (2 modules); final control - differentiated credit
Requirements of the teacher	timely completion of tasks, activity, teamwork.
Enrollment conditions	"free enrollment".

COMPLEMENTS THE STANDARD OF EDUCATION AND THE EDUCATIONAL PROGRAM

Competences	GC1. Ability to think abstractly, analyze and synthesizes. GC2. Ability to apply knowledge in practical situations. GC3. Knowledge and understanding of the subject field and profession. GC9. Ability to make informed decisions. PC2. The ability to use tools, special devices, devices, laboratory equipment and other technical means to carry out the necessary manipulations during the performance of professional tasks. PC3. Ability to follow the rules of labor protection, asepsis and antiseptics during professional activities. PC7. Ability to organize and conduct laboratory and special diagnostic studies and analyze their results.	**Program learning outcomes (PLO)**	PLO1. Know and correctly use the terminology of veterinary medicine. PLO3. To determine the essence of physico-chemical and biological processes that occur in the body of animals in normal and pathological conditions. PLO18. Carry out accounting reporting during professional activity. PLO20. To have specialized software tools for performing professional tasks.

STRUCTURE OF THE EDUCATIONAL COMPONENT (DISCIPLINES)

Module 1. CHARACTERISTICS OF THE MAIN RESEARCH METHODS. DETERMINATION OF METABOLITES OF METABOLISM.

Lection 1.	**Acquaintance with the devices and equipment of the biochemical laboratory: equipment.**	**Practical class 1 (PC 1).**	**Acquaintance with devices and equipment of a biochemical laboratory: dishes, their types, features of use, maintenance.**	**Independent work**	**Sampling and preparation for analysis. Requirements for working with biological material.** **Biochemical basis of veterinary enzymology.** **Osmotic resistance of erythrocytes (ORE) and its practical use in diagnostics.** **Study of biochemical parameters and their clinical and biochemical interpretation**
Lection 2.	**Solutions, composition, classification. Osmotic phenomena in living systems - endosmosis, exosmosis, turgor, lysis, hemolysis.**	**PC 2.**	**Characteristics of the main research methods.**		
Lection 3.	**Methods of studying metabolism: redox enzymes; the importance of dehydrogenases in metabolism: energy metabolism, substances that affect energy metabolism in cells.**	**PC 3.**	**Biochemical analyzers in laboratory diagnostics.**		
		PC 4.	**Osmotic resistance of erythrocytes (ORE) and its practical use in diagnostics.**		
Lection 4.	**Lipid metabolism. Determination of metabolites of lipid metabolism.**	**PC 5.**	**Structure and functions of biological membranes and cell pathology.**		
		PC 6.	**Vitamins and vitamin-like substances, their importance for the body.**		
		PC 7.	**Determination of metabolites of carbohydrate metabolism.**		
		PC 8.	**Basics of metabolism: study of the action of alcohol dehydrogenase, study of the action of peroxidase, quantitative determination of blood catalase activity, clinical diagnostic value of LDH.**		
		PC 9	**Metabolism of proteins. Determination of metabolites of protein metabolism.**		

		PC 10	Module 1 "Characteristics of the main research methods. Determination of metabolic metabolites" (test control).		
Module 2. BIOCHEMISTRY OF TISSUES AND BIOLOGICAL FLUIDS.					
Lection 5.	Blood biochemistry.	PC 11	Blood plasma proteins and non-protein nitrogenous components.	Independent work	Metabolism of macro- and microelements in pathology of internal organs. Biochemistry of the muscular system. Biochemistry of the nervous system.
Lection 6.	Biochemistry of urine. Detection of normal and pathological components of urine.	PC 12	Liver biochemistry.		
Lection 7.	Metabolism of macro- and microelements in pathology of internal organs.	PC 13	Biochemistry of the muscular system.		
		PC 14	Water-salt metabolism.		
		PC 15	Module 2 "Biochemistry of tissues and biological fluids" (test control).		

BASIC LITERATURE AND TEACHING MATERIALS

Literature

1. Laboratory Methods of Veterinary Biochemistry: Mehrdad Shamsaddini Bafti, Razi Vaccine and Serum Research Institute
2. Dahlhausen B. Future Veterinary Diagnostics. J. Exot. Pet Med. 2010;19:117–132. doi: 10.1053/j.jepm.2010.05.006. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
3. Soetan K., Abatan M. Biotechnology a key tool to breakthrough in medical and veterinary research. Biotechnol. Mol. Biol. Rev. 2008;3:88–94. [Google Scholar]

Teaching materials

1. Biochemistry [Text] : lecture workbook for foreign students 211 Veterinary medicine / V. Prichodchenko, N. Gladka, O. Denysova. - Kharkiv : EPC KSZA, 2021. - 311 p. - Б. ц.
2. http://moodle.btu.kharkiv.ua/login/index.php
3. https://aminbiol.com.ua/
4. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9454634/

RATING SYSTEM

SYSTEM		POINTS	ACTIVITIES TO BE ASSESSED
Final evaluation	100 points ECTS (standard)	up to 50	50% of the average grade for the modules
		up to 50	final test

Module-based assessment	**100 points total**	**up to 50**	**answers to test questions**
		up to 20	**oral answers at laboratory and practical classes**
		up to 30	**result of mastering the block of independent work**

STANDARDS OF ACADEMIC ETHICS AND INTEGRITY

All participants in the educational process (including students) must adhere to the Code of Academic Integrity and the requirements set forth in the Regulation "On Academic Integrity of Participants in the Educational Process of BSTU": to be disciplined, well-mannered, respect each other's dignity, show goodwill, honesty, and responsibility.