SILABUS OF THE EDUCATIONAL COMPONENT

BIOORGANIC CHEMISTRY

Specialty	**H6 Veterinary Medicine**	**Compulsory nature of the discipline**	**mandatory**
Educational program	**Veterinary Medicine**	**Faculty**	**Veterinary Medicine**
Educational level	**Second (master's) level**	**Department**	**Animal Physiology and Biochemistry**

TEACHER

Prykhodchenko Vita Oleksandrivna

Higher education – specialty veterinary medicine
Scientific degree - Candidate of Agricultural Sciences, specialty 03.00.13 - human and animal physiology
Academic title - Associate Professor
Work experience – more than 20 years
Indicators of professional activity on the course topic:

- author of more than 10 methodological developments;
- more than 15 years of experience in scientific work ;
- co-author of a workshop on biological chemistry;
- co-author more than 5 thematic publications;
- participant in scientific and methodological conferences.

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The following are involved in teaching the discipline: Associate Professor, Candidate of Agricultural Sciences Natalia Hladka.

GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT

Obgective	**formation of students' competencies in modern concepts of bioorganic chemistry, which allow them to master deep theoretical knowledge necessary for the study of related and applied disciplines. In addition, it allows them to understand the structure of animal tissues and chemical processes occurring in living systems.**
Format	**lectures, laboratory classes, independent work, individual assignments (abstracts).**
Detailing of learning outcomes and forms of their control	• **Be able to solve complex tasks and problems that arise in professional activities (GC2, SC2)/ individual practical classes.** • **Ability to follow the rules of labor protection, asepsis and antiseptics during professional activities. Ability to organize and conduct laboratory and special diagnostic tests and analyze their results (GC2, SC3)/ individual practical classes.** • **Ability to think abstractly, analyze, synthesize, search, and process information from various sources (GC2, PLO14)/ individual practical classes.**
Scope and forms of control	**6 ECTS credits (180 hours): 14 hours of lectures, 60 hours of laboratory classes, 106 hours of independent studies; test control by sections; final control - exam.**
Teacher requirements	**timely completion of tasks, activity, teamwork.**
Enrollment conditions	**"free enrollment"**

COMPLIANCE WITH THE EDUCATION STANDARD AND EDUCATIONAL PROGRAM

Competencies	**GC2. Ability to apply knowledge in practical situations.** **SC2. Ability to use tools, special devices, instruments, laboratory equipment and other technical means to perform the necessary manipulations when performing professional tasks.** **SC3. Ability to comply with the rules of labor protection, asepsis and antisepsis during professional activities.**	**Program learning outcomes**	**PLO14. Understand the essence of the processes of manufacturing, storing and processing biological raw materials.**

STRUCTURE OF THE EDUCATIONAL COMPONENT

Section 1. HYDROCARBONS. OXYGEN-CONTAINING ORGANIC COMPOUNDS

Lecture 1.	**Subject, methods and significance of bioorganic chemistry. Hydrocarbons: saturated, unsaturated, aromatic.**	**Laboratory class 1 (LC 1)**	**Subject, methods and significance of bioorganic chemistry. Hydrocarbons. Alkanes – saturated hydrocarbons.**	**Independent work**	**Cycloalkanes:** 1. General characteristics, isomerism and nomenclature of cycloalkanes. 2. Physical and chemical properties of cycloalkanes.
Lecture 2.	**Oxo compounds. Alcohols and phenols. Aldehydes and**	**LC 2**	**Unsaturated hydrocarbons – alkenes (theoretical lesson).**		3. A. Bayer's stress theory and the difference in the chemical properties

	ketones.				of "small" and "large" cycles. 4. Individual representatives and their practical use in animal husbandry. **Terpenes:** 1. General characteristics of terpenes. 2. Classification. 3. Meaning and use. 4. Properties. **Polyhydric alcohols:** 1. Triatomic alcohols (glycerols). 2. Homologous series. Isomerism, nomenclature. Methods of preparation. 3. Physical and chemical properties. 4. Characteristics, practical significance. **Simple ethers:** 1. Class characteristics. 2. Isomerism and nomenclature. 3. Methods of production. 4. Physical properties. 5. Chemical properties: interaction with concentrated hydrohalic acids, addition of hydrogen halides, formation of peroxides. 6. Characteristics of individual representatives .
Lecture 3.	**Carboxylic acids and their derivatives. Lipid chemistry.**	**LC 3**	**Unsaturated hydrocarbons – alkadienes, alkynes (theoretical lesson).**		
		LC 4	**Unsaturated hydrocarbons: classification, physical and chemical properties.**		
		LC 5	**Aromatic hydrocarbons (theoretical lesson).**		
		LC 6	**Aromatic hydrocarbons: classification, physical and chemical properties.**		
		LC 7	**Final lesson from the topic "Carbohydrates".**		
		LC 8	**Alcohols and phenols: classification, physical and chemical properties.**		
		LC 9	**Aldehydes and ketones (theoretical lesson).**		
		LC 10	**Aldehydes and ketones: classification, physical and chemical properties.**		
		LC 11	**Laboratory work "Alcohols and phenols, aldehydes and ketones."**		
		LC 12	**Monocarboxylic acids: classification, physical and chemical properties.**		
		LC 13	**Dicarboxylic acids and fats (theoretical lesson).**		
		LC 14	**Dicarboxylic acids and fats: classification, physical and chemical properties.**		
		LC 15	**Laboratory work "Carboxylic acids and fats."**		
		LC 16	**Lipid chemistry (theoretical class).**		
		LC 17	**Final lesson on the topic "Oxygen-containing organic compounds."**		
Chapter 2. MIXED FUNCTIONAL COMPOUNDS. NITROGEN-CONTAINING ORGANIC COMPOUNDS					
Lecture 4.	**Hydroxy acids.**	**LC 18**	**Hydroxy acids: classification, physical and chemical properties.**	**Independent work**	**Carbohydrate derivatives:** 1. Uronic acids and their biological role. 2. Aminosugars and their derivatives. Biological role. 3. Pectic compounds, gums, agar –
Lecture 5.	**Carbohydrates.**	**LC 19**	**Simple carbohydrates. Monosaccharides (theoretical lesson).**		
Lecture 6.	**Amines and amino acids.**	**LC 20**	**Monosaccharides: classification and chemical properties.**		

Lecture 7.	**Heterocyclic compounds and alkaloids.**	**LC 21**	**Disaccharides: classification and chemical properties.**		their structure and biological role. 4. Heteroglycosides. Their structure, distribution and biological role. **Antibiotics:** 1. Chemical basis of the antibacterial action of penicillins. 2. Cephalosporins. 3. Tetracyclines. 4. Peptide antibiotics. 5. Aminoglycoside antibiotics. Nucleoside antibiotics. **Introduction to vitaminology:** 1. Bioflavonoids and their medical and biological significance. 2. Vitamins of group K. 3. Ubiquinones .
		LC 22	**Polysaccharides: classification and biological role.**		
		LC 23	**Laboratory work on the topic "Carbohydrates".**		
		LC 24	**Final lesson from the section "Compounds with mixed functions."**		
		LC 25	**Amines (theoretical lesson).**		
		LC 26	**Amines: classification, physical and chemical properties.**		
		LC 27	**Amino acids: classification, physical and chemical properties.**		
		LC 28	**Laboratory work on the topic "Amino acids".**		
		LC 29	**Heterocyclic compounds (theoretical lesson).**		
		LC 30	**Final lesson on the topic "Nitrogen-containing and heterocyclic compounds."**		

BASIC LITERATURE AND METHODOLOGICAL MATERIALS

Literature

1. Organic Chemistry (third edition): student study guide and solutions manual / David Klein, 2016. – 711 p.
2. Chemistry (third edition): introducing inorganic, organic and physical chemistry / A. Burrows, J. Holman, A Parsons, G. Pilling, G. Price – Oxford, 2017. – 1432 p.
3. General, Organic and Biological Chemistry (seventh edition) / H. Stephan Stoker – Boston, 2014. – 1232 p.
4. Organic Chemistry by T. W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder. – January 20, 2016. – 1293 p.
5. Textbook of Organic Chemistry Paperback by V.K. Ahluwalia, Rakesh K. Parashar – 1 January 2012. – 504 p.
6. Organic Chemistry (second edition) / Jonathan Clayden, Nick Greeves, Stuart Warren. – Oxford, 2012. – 1187 p.

Methodological support

1. Compounds with mixed functions [Text]: teaching-methodical manual for applicants of the second (master's) level of higher education of full-time study in the specialty 211 Veterinary medicine / V. O. Prykhodchenko, N. I. Hladka, O. M. Denysova; State Biotechnological University – Kharkiv, 2023.– 44 p.
2. Nitrogen-containing compounds [Text]: teaching-methodical manual for applicants of the second (master's) level of higher education of full-time study in the specialty 211 Veterinary medicine / V. O. Prykhodchenko, N. I. Hladka, O. M. Denysova; State Biotechnical University – Kharkiv, 2023.– 29 p.
3. Hydrocarbons [Text] / comp.: V. Prykhodchenko, N. Hladka, O. Denysova. - Kharkiv : Style-Publishing, 2021. - 36 p.
4. Oxygen-Containing Compounds [Text] / comp.: V. Prichodchenko, N. Hladka, O. Denysova. - Kharkiv : Style-Publishing, 2021. - 32 p.
5. Chemistry [Text] : lecture workbook for foreign students 211 Veterinary medicine / V. Prykhodchenko, N. Hladka, O. Denysova. - Kharkiv : EPC KSZA, 2021. - 142 p.

EVALUATION SYSTEM

SYSTEM		POINTS	ACTIVITY TO BE EVALUATED
Final assessment (different credit, exam)	100 points ECTS (standard)	up to 100	40 % - Final testing 60 % - student's current work during the semester
Final assessment (non-differential credit)	100 points ECTS (standard)	up to 100	100 % - average grade for sections
Rating of section	100 points total	up to 30	30 % - answers to test questions
		up to 30	30 % - the result of mastering the block of independent work
		up to 40	40 % - student activity in class (oral answers)

NORMS 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 DBTU ": to demonstrate discipline, good manners, respect each other's dignity, show kindness, honesty, and responsibility.