

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

Objective	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 antiseptics during professional activities.	Program learning outcomes	PLO14. Understand the essence of the processes of manufacturing, storing and processing biological raw materials.
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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. 3. A. Bayer's stress theory and the difference in the chemical properties
Lecture 2.	Oxo compounds. Alcohols and phenols. Aldehydes and	LC 2	Unsaturated hydrocarbons – alkenes (theoretical lesson).		

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

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

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.
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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)		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.