



## SILABUS EDUCATIONAL COMPONENT

### CHEMISTRY AROUND US

specialty	H6 veterinary medicine	compulsory nature of the discipline	selective
educational program	veterinary medicine	faculty	veterinary medicine
educational level	Not limited	department	animal physiology and biochemistry

### TEACHER

#### Hladka Nataliia



**Higher education - specialty veterinary medicine**

**Scientific degree - Candidate of Agricultural Sciences, specialty 03.00.04 - Biochemistry**

**Academic rank - associate professor**

**Over 20 years of experience**

**Indicators of professional activity on the course topics:**

- author of more than 5 methodological developments;
- over 20 years of scientific experience;
- co-author of the workshop on biological chemistry;
- co-author of more than 2 thematic publications;
- participant of scientific and methodological conferences.

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Associate Professor, Candidate of Agricultural Sciences Vita Prykhodchenko is involved in teaching the discipline

## GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT (DISCIPLINE)

Objective	Understand the importance of chemical processes in various aspects of life, such as everyday life, industry, medicine, etc.; develop critical thinking and analytical skills as they relate to the principles of chemistry and their application to different situations; prepare for further study of biochemistry and related sciences in the future.
Format	lectures, laboratory and practical classes, independent work, individual assignments.
Detailing learning outcomes and forms of their control	<ul style="list-style-type: none"> <li>Ability to abstract thinking, analysis, synthesis. Ability to make informed decisions. (GC1, GC9, PLO20) / <b>individual practical classes.</b></li> <li>Commitment to environmental protection. Ability to comply with the rules of labor protection, asepsis and antisepsis during professional activities. Ability to protect the environment from pollution by livestock waste, as well as materials and means of veterinary use. (GC12, PC3, PC16, PLO17) / <b>individual practical training.</b></li> <li>Ability to apply knowledge in practical situations. Knowledge and understanding of the subject area and profession. (GC2, GC3, PLO1, PLO10) / <b>individual practical classes.</b></li> </ul>
Scope and forms of control	3 ECTS credits (90 hours): 12 hours of lectures, 18 hours of laboratory and practical classes, 60 hours of independent study; current control (2 sections); final control - differentiated credit.
Teacher requirements	timely completion of tasks, activity, teamwork.
Terms of enrollment	"free enrollment".

## COMPLEMENTS THE EDUCATION STANDARD AND EDUCATIONAL PROGRAM

Competencies	<p>GC1. Ability to think abstractly, analyze and synthesize.</p> <p>GC2. Ability to apply knowledge in practical situations.</p> <p>GC3. Knowledge and understanding of the subject area and profession.</p> <p>GC9. Ability to make informed decisions.</p> <p>GC12. Striving to preserve the environment.</p> <p>PC3. Ability to comply with the rules of labor protection, asepsis and antisepsis during professional activities.</p> <p>PC16. Ability to protect the environment from contamination by livestock waste, as well as materials and veterinary products.</p>	Program learning outcomes	<p>PLO1. Know and correctly use the terminology of veterinary medicine.</p> <p>PLO10. Propose and use appropriate innovative methods and approaches to solving problem situations of professional origin.</p> <p>ELO17. Know the rules and requirements of biosafety, bioethics and animal welfare.</p> <p>PLO20. To have specialized software tools for performing professional tasks.</p>
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## STRUCTURE OF THE EDUCATIONAL COMPONENT (DISCIPLINE)

## Section 1: Chemistry in everyday life.

Lecture 1.	<b>Basic concepts of chemistry:</b> 1. Introduction to chemistry, its basic principles and concepts. 2. The structure of the atom and the periodic table of elements. 3. Biological molecular chemistry: proteins, nucleic acids, carbohydrates, lipids.	<b>Laboratory and practical class 1 (LPC 1).</b>	<b>How substances are studied.</b> 1. Observation and experiment in chemistry. 2. Physical properties of substances.	Independent work	<b>Methods of analysis and research at the molecular level:</b> 1. Methods of molecular structure analysis. 2. Methods for determining the chemical properties of molecules. 3. Methods of studying molecular interaction.  <b>Chemistry of the food industry:</b> 1. Fermentation processes in the production of bread, beer, cheese, and other products. 2. Antioxidant properties and use of preservatives in food products.  <b>Atmospheric pollution and its chemical causes:</b> the impact of emissions from transport, industry, and other sources of pollution.  <b>Chemical processes in aquatic ecosystems:</b> the impact of pollution on water resources, methods of water purification.
		LPC 2.	<b>The importance of chemistry in everyday life:</b> 1. In nutrition (composition and properties of food components, chemical reactions during cooking) 2. In everyday life (composition and effect of detergents, soaps, cosmetics, interaction of chemicals in everyday life) 3. In medicine (medicines and their effects on the body, diagnostics using chemical analyzes).		
Lecture 2.	<b>Environmental chemistry:</b> 1. Environmental pollution and its impact on health. 2. The role of chemistry in solving environmental problems.	LPC 3.	<b>Chemical safety:</b> 1. Assess the risks of using chemicals in everyday life. 2. Safety rules when interacting with chemicals.		

## Section 2: Chemical phenomena in various fields.

Lecture 3.	<b>The role of chemistry in solving the raw materials problem</b> 1. Efficient use of raw materials	LPC 4.	<b>Use of alternative raw material sources:</b> 1. How chemistry can contribute to the use of alternative raw material sources, such		
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	2. Waste processing (chemical processing methods, methods of reuse)		as secondary raw materials or renewable sources. 2. The influence of chemistry on the development of new materials that can be obtained from alternative sources.		<b>Independent work</b>	<b>Biotechnology and artificial meat production:</b> 1. The role of biotechnology in the production of meat and other animal products. 2. Chemical aspects of artificial meat growing in laboratories.  <b>Chemistry of agriculture and agro-industry:</b>  1. The use of pesticides and their impact on agriculture and the environment. 2. Herbicides and their impact on plants and soil ecosystems.
<b>Lecture 4.</b>	<b>Principles of green chemistry:</b> 1. Overview of basic principles such as waste prevention, safety, and the use of renewable resources. 2. How green chemistry differs from traditional chemistry and what benefits it provides.	<b>LPC 5.</b>	<b>Chemistry of renewable energy sources:</b> 1. The use of chemistry in the production and storage of renewable energy (solar, wind, hydroelectric).			
		<b>LPC 6.</b>	<b>Green chemistry</b> 1. The role of green chemistry in reducing the environmental impact of production on nature. 2. Development of environmentally friendly chemical processes and products.			
<b>Lecture 5.</b>	<b>The role of chemistry in solving the food problem</b> 1. Use of chemical methods to improve plant properties (disease resistance, increased yield). 2. The use of chemistry in packaging and preservation of products. 3. The role of chemicals in the control of plant pests and diseases.	<b>LPC 7.</b>	<b>Chemistry in food processing technologies:</b> 1. The use of chemistry in the production of food additives and confectionery. 2. Innovative chemical processing methods to improve product properties.			
		<b>LPC 8.</b>	<b>Chemical phenomena in various fields: science and technology</b> 1. Chemical reactions in the pharmaceutical industry. 2. 2. Nanomaterials. 3. Energy technologies.			
<b>Lecture 6.</b>	<b>Chemical phenomena in industry and transportation</b> 1. Synthesis of polymers. 2. Catalysts in chemical reactions. 3. Quality control and analysis of chemicals. 4. Corrosion and protection against it.	<b>LPC 9.</b>	<b>The final lesson of the course. Discussion of the material studied (student reports). Reflection.</b>			

## BASIC LITERATURE AND METHODOLOGICAL MATERIALS

Literature	<ol style="list-style-type: none"> <li>1. Kat Day, Nigel Saunders, Iain Brand, Anna Claiborne. Super Simple Chemistry The Ultimate Bitesize Study Guide, 2021. 288 p.</li> <li>2. Bonnie Garmus. Lessons in Chemistry, 2024. 416 p.</li> <li>3. Biotechnology in ecology: a textbook / A.I. Horova, S.M. Lysytska, A.V. Pavlichenko, T.V. Skvortsova - D.: National Mining University, 2012. 184 p.</li> <li>4. Cambridge International GCSE Chemistry Complete Revision &amp; Practice, 2018. 208 p.</li> <li>5. SCIENCE AROUND US (parts 1, 2, 3) Publisher Macmillan Education Eswatini</li> </ol>	Methodological support	<ol style="list-style-type: none"> <li>1. <a href="https://chem.libretexts.org/Courses/San_Diego_Miramar_College/Chem_103%3A_Fundamentals_of_GOB_Chemistry_(Garces)/01%3A_Chemistry_Around_Us">https://chem.libretexts.org/Courses/San Diego Miramar College/Chem_103%3A_Fundamentals_of_GOB_Chemistry_(Garces)/01%3A_Chemistry_Around_Us</a></li> <li>2. <a href="https://www.youtube.com/@TEtiAnaCHychkovska">https://www.youtube.com/@TEtiAnaCHychkovska</a></li> <li>3. <a href="http://moodle.btu.kharkiv.ua/course/view.php?id=3901">http://moodle.btu.kharkiv.ua/course/view.php?id=3901</a></li> </ol>
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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)	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 SBU": to be disciplined, well-mannered, respect each other's dignity, show goodwill, honesty, and responsibility.