SYLLABUS OF THE EDUCATIONAL COMPONENT

POISONS AND IMPACT ON A LIVING ORGANISM

specialty	**211 Veterinary medicine**	**mandatory discipline**	**selective**
educational program	**«Veterinary medicine»**	**faculty**	**veterinary medicine**
educational level	**not limited**	**chair**	**physiology and biochemistry of animals**

TEACHER

Irina Zhukova

Higher education – specialty: veterinary medicine
Scientific degree – Doctor of Veterinary Sciences 16.00.04 Veterinary Pharmacology and Toxicology
Academic title – Professor of the Department of Animal Physiology and Biochemistry
Work experience – more than 35 years
Indicators of professional activity on the course topic:

- author of more than 20 methodological developments;
- co-author of more than 20 thematic publications;
- participant in scientific and methodological conferences.

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The following are involved in teaching the discipline: Associate Professor, Candidate of Biological Sciences Tetyana Yakimenko.

GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT (DISCIPLINE)

Aim	**understanding the mechanisms of action of poisons on various organs and systems of the body, including the nervous, circulatory, respiratory and others; studying different classes of poisons, their sources, chemical structure and effects on the body; familiarization with methods of diagnosis, treatment and prevention of poisoning; ability to analyze and assess the risks of poisoning in various situations, such as industry, domestic use, environmental pollution, etc.**
Form	**lectures, laboratory and practical classes, independent work, individual tasks.**
Detailing of learning results and forms of their control	• **Ability to abstract thinking, analysis, synthesis. Ability to make informed decisions. (GC1, GC9, PLO20) / individual practical classes.** • **The desire to preserve the environment. The ability to follow the rules of labor protection, asepsis and antiseptics during professional activities. The ability to protect the environment from pollution by livestock waste, as well as materials and veterinary products. (GC12, PC3, PC16, PLO17) / individual practical classes.** • **Ability to apply knowledge in practical situations. Knowledge and understanding of the subject area and profession. (GC2, GC3, PLO1, PLO10)/ individual practical classes.**
Scope and forms of control	**3 ECTS credits (90 hours): 12 hours of lectures, 18 hours of laboratory and practical work, 60 hours of independent study; current monitoring; final control - differentiated test.**
Teacher requirements	**timely completion of tasks, activity, teamwork.**
Enrollment conditions	**according to the curriculum**

COMPLEMENTS THE STANDARD OF EDUCATION AND THE EDUCATIONAL PROGRAM

Competencies	GC1. Ability for abstract thinking, analysis and synthesis. GC2. Ability to apply knowledge in practical situations. GC3. Knowledge and understanding of the subject area and profession. GC9. Ability to make informed decisions. GC12. The desire to preserve the environment environment. PC3. Ability to comply with the rules of labor protection, asepsis and antiseptics during professional activities. PC16. Ability to protect the environment from pollution by livestock waste, as well as materials and veterinary products.	**Program learning outcomes**	PLO1. Know and correctly use the terminology of veterinary medicine. PLO10. Propose and use appropriate innovative methods and approaches to solving problem situations of professional origin. PLO17. Know the rules and requirements of biosafety , bioethics, and animal welfare. PLO20. Possess specialized software tools to perform professional tasks.

STRUCTURE OF THE EDUCATIONAL COMPONENT

Section 1. CLASSIFICATION OF POISONS AND MECHANISMS OF THEIR ACTION

Lecture 1.	**Introduction to toxicology. Classification of toxic substances according to various characteristics.** 1. Definition of the concepts of toxins,	**LPC 1.**	**Characterization of the toxic properties of individual heavy metals.** 1. Definition and characterization of heavy metals. 2. The role of heavy metals in various fields such as	**Independent work**	1. History of the development of toxicology. 2. General characteristics of toxic effects.

	poisons and toxicology. 2. Types of poisons of organic and inorganic origin, their classification 3. Biotoxins.		industry, agriculture, medicine, etc. 3. Methods for determining the content of heavy metals.		3. Interaction between the body and toxic substances. 4. Assessment of the degree of ecotoxicity: theoretical and experimental. 5. Determination of acute environmental toxicity. 6. Determination of chronic toxicity. 7. Clarifying the nature of the cumulative effect. 8. Acute ecotoxicity testing of production waste. 9. Determination of the toxicity class of industrial waste.
		LPC 2.	**Analysis of drinking water, vegetables and fruits for nitrate content.** 1. Origin of nitrates: agriculture, industry, atmospheric nitrogen, wastewater, etc. 2. Methods for analyzing nitrates in drinking water, vegetables and fruits. 3. Standards and requirements for drinking water safety in different countries. 4. Limit values and standards for nitrate content in food.		
Lecture 2.	**Pathogenesis of the action of poisons of various origins on the animal and human body.** 1. Neurotoxic, hemotoxic and hepatotoxic effects of toxicants on the body. 2. Therapeutic and pathoanatomical features of the diagnosis of poisoning with organic and inorganic substances	**LPC 3.**	**Zootoxins – their toxicological characteristics and recommendations for avoiding poisoning.** 1. Overview of different types of zootoxins and their distribution in nature. 2. The impact of zootoxins on human and animal health and the ecosystem. 3. Recommendations for avoiding zootoxic poisoning in the natural environment and during product processing.		
		LPC 4.	**Phytotoxins – toxicological characteristics and recommendations for avoiding poisoning.** 1. Types of plant toxins and their classification. 2. The impact of phytotoxins on human and animal health and the ecosystem. 3. Risks of consuming foods contaminated with phytotoxins. 4. Recommendations for avoiding phytotoxin poisoning when interacting with plants and food products.		
Lecture 3.	**The effect of poisons on individual organs and systems.** 1. Cardiotoxic effect of poisons on the body. 2. Irritating effect of xenobiotics on the body. 3. Systemic effect of poisons on the body.	**LPC 5.**	**Characterization of the hazardous properties of mycotoxins and recommendations for avoiding poisoning.** 1. Types of mycotoxins and their classification. 2. The impact of mycotoxins on human and animal health and the ecosystem. 3. Risks of eating food contaminated with mycotoxins. 4. Laboratory and analytical methods for determining the content of mycotoxins. 5. Recommendations for avoiding mycotoxin poisoning when interacting with mushrooms and food products.		
Section 2. METHODS FOR DETERMINING TOXIC SUBSTANCES, TREATMENT AND PREVENTION OF POISONING					
Lecture 4.	**Principles of first aid for poisoning.**	**LPC 6.**	**Treatment and prevention of poisoning. Use of antidotes.**		1. Environmental pollution.

	Detoxification methods. 1. First aid in case of poisoning. 2. Individual approaches to detoxification depending on the type of poison. 3. The roles of the liver and kidneys in detoxification.		1. Laboratory methods for detecting poisons. 2. Clinical diagnosis of poisoning. 3. Antidotes and other treatments.		2. Justification for the placement of hazardous waste in landfills. 3. Procedure for accumulation, transportation, decontamination and disposal of toxic industrial waste. 4. Diagnostics of environmental pollution. 5. Regulation of anthropogenic pollution. 6. Environmentally safe means of controlling weeds and pests.
Lecture 5.	**Determination of toxic substances in raw materials and food products using qualitative and quantitative methods.** 1. Main indicators of food safety. 2. Safety of industry products.	**LPC 7.**	**Qualitative methods for determining toxic substances in raw materials and food products.** 1. Use of biological tests. 2. Immunological research methods. 3. Chemical tests.		
		LPC 8.	**Quantitative methods for determining toxic substances in raw materials and food products.** 1. Chromatographic methods of analysis. 2. Electrochemical analysis methods. 3. Optical analysis methods.		
Lecture 6.	**Regulation in the field of chemical safety and control of the use of toxic substances in the European Union.** 1. Legal aspects in the field of poisoning. 2. Responsibility for the use of poisons in industry and agriculture. 3. Chemical safety legislation.	**LPC 9.**	**The impact of toxicants on the environment.** 1. Soil and water pollution with poisons. 2. Environmental aspects of the use of chemicals.		

BASIC LITERATURE AND METHODOLOGICAL MATERIALS

Literature	1. Shevryakov M.V. Fundamentals of toxicological chemistry: [textbook] – Kyiv: Helvetica Publishing House , 2020. – 224 p. 2. Gandzyura V.P. Productivity of biosystems under toxic environmental pollution by heavy metals. – Kyiv: VGL “Obrii”, 2002. – 248 p. 3. Express methods of research of safety and quality of food products [Electronic resource] : teaching manual / V.V. Yevlash , S.O. Samoilenko, N.O. Otroshko , I.A. Buryak. – Kh.: KhDUKHT, 2016. – 336 p. 4. Gandzyura V.P. Ecology. Textbook. Third edition, revised and supplemented (with the stamp of the Ministry of Education and Science of Ukraine) – K., Stal, 2012. – 390 p. 5. Khatsevich O.M., Skladanyuk M.B. Chemistry and analysis of food products: Laboratory practical course. – Educational and methodical manual. – Ivano-Frankivsk: Publishing house Suprun V.P., 2019. – 105 p. 6. Toxicological chemistry: teaching -methodical manual for students of the Faculty of Pharmacy of correspondence form of study / compiled by O. I. Panasenko [and others]. – Zaporizhia: ZDMU, 2015. – 235 p. 7. Veterinary toxicology: textbook / Kutsan O.T., Dukhnytskyi V.B., Boyko G.V., Ishchenko V.D. Kyiv: NUBiP of Ukraine, 2022.- 413 p. 8. Veterinary toxicology: textbook / G. O. Khmelnytsky, O. O. Malinin , O. T. Kutsan, V. B. Dukhnytsky ; ed. G. O. Khmelnytsky, V. B. Dukhnytsky . - Kyiv: Agrarna osvita, 2012. - 352 p. 9. Fundamentals of toxicological safety of feeds in agriculture [Text] / O. L. Orobchenko , M. E. Romanko , Anat . P. Paliy, And. P. Paliy, O. V. and others . — Kharkiv: Stil- Izdat , 2023. — 697 p.	**Methodological support**	**1**. Fedyshyn B.M., Dorokhov V.I., Pavlyuk G.V. et al. Environmental Chemistry. Textbook. – Kherson: Oldi -plus, 2014 – 512 p. 2. Dyman T.M., Mazur T.G. Safety of food raw materials and food products. – K.: Academic Center, 2011. – 520 p. 3. Mykhaylovska T.M. Chemical toxicology. Part 1. – Chernivtsi, 2010. – 400 p. 4. Ecotoxicology : textbook/ Snitynskyi V.V., Khirivskyi P.V. - Kherson: Oldi -plus, 2011. - 330 p. 5. Laboratory veterinary toxicology: a textbook / V.I. Levchenko, A.V. Rozumnyuk , Y.M. Novozhytska and others - Bila Tserkva, 2012. – 216 p. 6. https://www.youtube.com/watch?v=hYZuyAf84jE 7. http://moodle.btu.kharkiv.ua/course/view.php?id=3903

GRADING SYSTEM

SYSTEM		POINTS	ACTIVITY THAT IS ASSESSED
Summative assessment (differentiated test, exam)	**100 ECTS points (standard)**	**to 100**	**40 % - final testing** **60 % - student's current work during the semester**

Section evaluation	**100-point total**	**to 30**	**answers to test questions**
		to 30	**result of mastering the independent work block**
		to 40	**student activity in classes (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 stipulated 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.