SYLLABUS OF THE EDUCATIONAL COMPONENT

ORGANIZATION OF BIOLOGICAL RESEARCH

speciality	**211 Veterinary medicine**	**mandatory or optional**	**Mandatory**
educational program	**Veterinary medicine**	**faculty**	**Veterinary medicine**
educational degree	**magistr**	**department**	**Internal diseases and clinical diagnosis of animals**

TEACHER

Kybkalo Dmytro Viktorovych

Higher education – specialty veterinary medicine

Academic degree – Doctor of Veterinary Sciences in specialty 16.00.01-diagnostics and therapy of animals

Academic title – professor

Work experience – 20 years

Indicators of professional activity on the subject of the course:

- Author of 3 monographs, more than 30 publications;
- experience of scientific work 23 years;
- co-author of 7 publications in Scopus and Web of Science.
- participant in scientific conferences
    - head of scientific research.
-

телефон	**0502209712**	**електронна пошта**	**diagnost_96@ukr.net**	**дистанційна підтримка**	**Moodle http://moodle.btu.kharkiv.ua/course/view.php?id=428**

GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT (DISCIPLINE)

Мета	The purpose of the academic discipline is to study a wide range of issues in the field of higher education (its formation, reformation, development in individual countries, the creation of the European space of education and science in accordance with the Bologna Declaration), the role of science in the life of society (its development in different historical eras, the role of scientific prognosing, the role and place of a scientist in society), formation of a young scientist (choosing the topic of scientific work, mastering research methods and methodology, analysis of research material, its examination), familiarization with means of scientific and technical information, system of invention and patent science, problems of bioethics in scientific work, preparation of materials for publication and their official protection.
Format	lectures, practical classes, independent work, individual tasks, laboratory work, team work
Form of control	4 ECTS credits (120 hours): 14 hours of lectures, 30 hours of laboratory hours, 76 hours of independent work; current control (2 tests); final control - differentiated assessment.
Requirements	timely completion of laboratory and practical tasks, activity, teamwork
Enrollment conditions	according to the curriculum

COMPLIANCE WITH THE STANDARD OF EDUCATION AND THE EDUCATIONAL PROGRAM

Competencia	GC1 Ability to abstract thinking, analysis and synthesis GC 6 Skills of using information and communication technologies. GC7 Ability to conduct research at the appropriate level GC8 Ability to learn and master modern knowledge SC6 The ability to select, pack, fix and send samples of biological material for laboratory research. SC 18 Ability to use specialized software tools to perform professional tasks	**Program learning outcomes**	PLO 20 To have specialized software tools for performing professional tasks

STRUCTURE OF THE EDUCATIONAL COMPONENT

Chapter 1 Methodology of scientific research

Lecture 1	**Science and scientific research.** The main stages of the development of science. Classification of sciences. Science.	**LPL 1-2**	Elements of theory and methodology of scientific and technical creativity. Methodology of scientific research. Manifestations of scientific creativity Manifestations of technical creativity.	**Self work**	1.Classification of sciences. Basic sciences and superstructures. Integration and differentiation of sciences. Elements of science. 2.Knowledge and cognition. Sensory and rational cognition. Definition of concepts. Judgment. Condition Thinking. A scientific idea. Hypothesis. Law. Paradox. Theory. Axiom (postulate).
		LPL 3-4	Scientific research: purpose, objects and subjects. Classification of scientific research. Selection of the goal of scientific research.		
Lecture 2	**Systematicity in scientific knowledge.** Signs	**LPL 5-6**	Tasks and methods of theoretical research.		

	and principles of system definition. Classification of systems. Methodological foundations of system research.		Definition of working hypothesis. Setting goals, objectives, and tasks. Theoretical justification of the experiment.		
Lecture 3	**Methodology of scientific research**. Formulation of the topic, goal and tasks of scientific research. Methodology of experimental research. Rules and basic requirements for the design of scientific works	**LPL 7-8**	Modeling in scientific work. Basics of scientific modeling. Objects of research in veterinary medicine. Biotic aspects of the experiment.		
		LPL 9	***Methodology of scientific research. Execution of situational tasks.***		
Chapter 2 Analysis and processing of research data					
Lecture 4-5	**Statistical processing of experimental data.** Parametric methods of statistical analysis. Non-parametric methods of statistical analysis. Summarizing and recording the results of the experiment.	**LPL 10-11**	Processing of the results of experimental studies Obtaining empirical results. Statistical processing of results. Record the results of the experiment.	**Self work**	1.Methodology. Research methods. Method and technique. General, scientific and special methods. Axiomatic, hypothetical, historical and systemic methods. Scientific research. The purpose of scientific research. Object and subject of research. Classification of scientific research. Scientific direction. Complex problem, problem, topic, scientific questions (tasks). Assessment of feasibility of conducting research. 2.Levels of creativity. Discovery, invention, innovative proposal. Characteristics of a creative personality. Theories of analogy, similarities and dimensions. Stages of theoretical research. Terms and conditions. Mathematical modeling methodology. Mathematical model. Definition of the object and purpose of the research. Selection of a mathematical model class. Classification and structure of the experiment.
Lecture 5	**Invention and rationalization.** Invention and development of scientific creativity. Discoveries and inventions. Fundamentals of patent science.				
Lecture 6	**Presentation of research in the form of scientific papers.** Rules and general requirements for writing scientific papers. Publication of scientific papers. Peer review of scientific works.	**LPL 12-13**	Rules for the design of final papers. Drafting of scientific articles, theses and other printed works.		
		LPL 14	Designing a master's thesis.		
		LPL 15	***Analysis and processing of research data Execution of situational task***s.		

BASIC LITERATURE AND ADDITIONAL MATERIALS

Literature

Basic literature

1. Christopher, M. M. (2015). A new decade of veterinary research: societal relevance, global collaboration, and translational medicine. Frontiers in Veterinary Science, 2, 1.
2. National Research Council, Division on Earth, Life Studies, & Committee on the National Needs for Research in Veterinary Science. (2005). Critical needs for research in veterinary science.
3. National Research Council, Division on Earth, Life Studies, Institute for Laboratory Animal Research, & Committee on Increasing Veterinary Involvement in Biomedical Research. (2003). National need and priorities for veterinarians in biomedical research.
4. Rosol, T. J., Moore, R. M., Saville, W. J., Oglesbee, M. J., Rush, L. J., Mathes, L. E., & Lairmore, M. D. (2009). The need for veterinarians in biomedical research. Journal of veterinary medical education, 36(1), 70-75.
5. Turner, P. V., Pekow, C., Clark, J. M., Vergara, P., Bayne, K., White, W. J., ... & Baneux, P. (2015). Roles of the international council for laboratory animal science (ICLAS) and international association of colleges of laboratory animal medicine (IACLAM) in the global organization and support of 3Rs advances in laboratory animal science. Journal of the American Association for Laboratory Animal Science, 54(2), 174-180.

Additional literature

1. Christopher, M. M., & Marusic, A. (2013). Geographic trends in research output and citations in veterinary medicine: insight into global research capacity, species specialization, and interdisciplinary relationships. BMC veterinary research, 9, 1-16.
2. Crawley-Low, J. (2006). Bibliometric analysis of the American Journal of Veterinary Research to produce a list of core veterinary medicine journals. Journal of the Medical Library Association, 94(4), 430.
3. Fox, J. G., & Obernier, J. (2005). Veterinarians in biomedical research: a perilous future?. Journal of Veterinary Medical Education, 32(3), 301-305.
4. Giles, A. R. (1987). Guidelines for the use of animals in biomedical research. Thrombosis and haemostasis, 58(08), 1078-1084.
5. Hrapkiewicz, K., Colby, L. A., & Denison, P. (2013). Clinical laboratory animal medicine: an introduction. John Wiley & Sons.
6. National Research Council (US) Committee on the National Needs for Research in Veterinary Science. (2005). Progress and opportunities in veterinary research. In Critical needs for research in veterinary science. National Academies Press (US).
7. Willis, N. G., Monroe, F. A., Potworowski, J. A., Halbert, G., Evans, B. R., Smith, J. E., ... & Bradbrook, A. (2007). Envisioning the future of veterinary medical education: the Association of American Veterinary Medical Colleges Foresight Project, final report. Journal of Veterinary Medical Education, 34(1), 1-41.

Methodical support

1. Kartashov M.I. Borovkov S.B. “Methodical instructions for laboratory classes: on the basics of scientific research” Kharkiv.: KhDZVA, 2009. –40 p.
2. Borovkov S.B. Methodical instructions for laboratory classes: section “Experimental research with the basics of statistics Kharkiv.: KhDZVA, 2009. –36 p.

ASSESSMENT SYSTEM

SYSTEM	SCORE	ACTIVITY THAT EVALUATED

Final assessment (differentiated credit, exam)	**100-point ECTS (standard)**	**до 100**	**40% – final testing, 60% – student's ongoing work during the semester**
Final assessment (non-graded)	**100-point ECTS (standard)**	**до 100**	**100% – averaged score for all course sections**
Section Assessment	**Cumulative 100-point scale**	**до 30**	**30% – answers to test questions**
		до 30	**30% – performance on the independent study block**
		до 40	**40% – student activity during classes (oral responses)**

NORMS OF ACADEMIC ETHICS AND CHARITY

All participants in the educational process (including those seeking education) must adhere to the code of academic integrity and the requirements prescribed in the provision "On academic integrity of participants in the educational process of SBU": show discipline, education, respect each other's dignity, show kindness, honesty, responsibility.