

SYLLABUS OF THE EDUCATIONAL COMPONENT



VETERINARY IMMUNOLOGY

speciality	211 – Veterinary Medicine	Discipline status	mandatory
Field of knowledge	ветеринарна медицина	Faculty	Veterinary Medicine
educational level	Not limited	department	Department of epizootology and microbiology

TEACHER

Harahulya Halina



Higher education - veterinary medicine specialty

Scientific degree - candidate of veterinary sciences, specialty 16.00.03-veterinary microbiology, virology and immunology

Academic title - associate professor

Work experience - 24 years

Indicators of professional activity on the subject of the course:

- author of 15 methodological developments;
- 24 years of experience in scientific work;
- participant of scientific and methodical conferences.

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Candidates of veterinary sciences, Basko Sabina, are involved in the teaching of the discipline

GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT (DISCIPLINE)

The purpose of the discipline	The purpose of the discipline "Veterinary Immunology" is to provide students with the necessary theoretical knowledge and practical skills and abilities on the technique of obtaining and preparing for research biological material obtained from animals for conducting immunological studies, establishing immunological indicators and their further interpretation in the course of diagnosing infectious diseases of animals and establishing their immune status.
Format	lectures, practical employment (occupations), self-contained work of students, consultations.
Detailing of learning results and forms of their control	<ul style="list-style-type: none"> • the ability to observe the rules of personal safety when researching animals, using knowledge about their fixation, follow the rules of personal hygiene, use the rules of asepsis and antiseptics when carrying out any intervention or research • the ability to conduct research at an appropriate level, apply knowledge in practical situations, use tools, special devices for carrying out special manipulations during the performance of professional tasks • ability to carry out vaccination by enteral and parenteral methods • understand and find out the specifics of conducting clinical research in order to form conclusions about the condition of the animal and establish the effectiveness of vaccination • ability to abstract thinking, analysis, synthesis, search, processing of information from various sources
Scope and forms of control	5 ECTS credits (150 hours): 18 hours of lectures, 54 hours of laboratory-practical classes; 60 hours of self-study, modular control (2 modules); final control - differentiated assessment.
The teacher's requirements	timely completion of tasks, activity, teamwork
Enrollment conditions	"free enrollment"

COMPLEMENTS THE STANDARD OF EDUCATION AND THE EDUCATIONAL PROGRAM

Competences	<ol style="list-style-type: none"> 1. Ability to think abstractly, analyze and synthesize, search, process information from various sources. 2. Ability to apply knowledge in practical situations. 3. The ability to conduct research at the appropriate level, make informed decisions, evaluate and ensure the quality of the work performed. 4. The ability to understand and find out the peculiarities of the structure and functioning of cells, tissues, organs, their systems and apparatuses of the animal body. 5. The ability to observe the rules of safety, asepsis and antiseptics during professional activities. 7. The ability to conduct clinical research in order to formulate conclusions about the condition of animals or establish a diagnosis. 8. Ability to develop prevention strategies. 9. The ability to carry out professional activities within the chosen specialization. 10. Ability to plan, organize and implement measures for the treatment of diseases of small animals. 	Program learning outcomes	<ol style="list-style-type: none"> 1. PRN 7. Collect anamnesic data during registration and examination of animals, find solutions regarding the choice of effective methods of prevention of animal diseases. 2. PRN 8. Explain the essence and dynamics of the development of physiological processes that occur in the body of animals under the influence of environmental factors and the action of infectious agents.
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STRUCTURE OF THE EDUCATIONAL COMPONENT (DISCIPLINES)

Chapter 1 Theoretical foundations of veterinary vaccinology

Lecture 1	INTRODUCTION INTO IMMUNOLOGY. THE INNATE DEFENSE MECHANISMS	Practical classes 1 (PC 1)	Rules of work in the immunological laboratory	Independent work	<p>Theories of the development of immunology. Evolution of the immune system. Scientists-immunologists, laureates of the Nobel Prize - independent biography of an individual scientist.</p> <p>Morphological features of the structure of the central and peripheral organs of the immune system.</p> <p>Types of phagocytes and their functions (neutrophils, monocytes, macrophages, SMF). Phagocytosis and complement as non-specific factors of immunity.</p> <p>Phagocytosis and complement - participation in specific immune reactions.</p> <p>The role of T- and B-lymphocytes in immunity.</p> <p>Differentiation of T-lymphocytes in the thymus.</p> <p>The mechanism of lymphocyte circulation.</p> <p>Groups of mediators and their functions (pro-inflammatory and anti-inflammatory). Interaction of cellular and humoral factors of immunity during the inflammatory reaction.</p> <p>Superfamily of immunoglobulins (Ig). Formation and differentiation of Ig. Classes Ig. Switching classes Ig.</p>
Lecture 2	Basic molecules of the immune system	PC 2	Study of organs of the immune system		
Lecture 3	IMMUNE CELLS	PC 3	Study of immunocompetent cells of various organs		
Lecture 4	The inflammatory response. Part 1.	PC 4	Study of non-specific immunity factors using the example of lysozyme.		
Lecture 5	The inflammatory response. Part 2.	PC 5	Study of phagocytic activity of neutrophils		
		PC 6	Obtaining bacterial antigens.		
		PC 7	Blood serum as a source of immunoglobulins.		
		PC 8	Obtaining hyperimmune sera.		
		PC 9	Isolation of individual classes of immunoglobulins.		
		PC 10	Final lesson (module #1)		

Chapter 2. Clinical veterinary immunology

Lecture 6	Adaptive immune response. Part 1.	PC 11	Serological reactions.	Independent work	<p>Features of the immune response to different types of antigens (AG). Antigen (AG) and antibody (AT) interaction phenomena and methods of their detection. The role of serological research methods in infectious pathology and their features. Methods of obtaining monoclonal antibodies</p> <p>Types of diagnostics (AG-no and AT-no), methods of their manufacture, application. Peculiarities of preparation of material for research. Comparison of the sensitivity of different serological reactions.</p> <p>Immunoematology: blood groups, Rhesus factor system, hemolytic disease.</p> <p>Hypersensitivity. Transplantation. Immunodeficiencies. Autoimmune diseases.</p>
		PC 12	Precipitation reaction (RP) and its modifications (Ascoli reaction, RDP).		
		PC 13	The phenomenon of agglutination. Qualitative agglutination reactions (RA).		
Lecture 7	Adaptive immune response. Part 2.	PC 14	Quantitative agglutination reactions (RA).		
		PC 15	Hemagglutination reactions (RHA, RZHA, RNHA)		
Lecture 8	REGULATION OF ADAPTIVE IMMUNITY	PC 16	Complement binding reaction (CRF).		
		PC 17	Neutralization reaction (PH)		
		PC 18	The phenomenon of labels.		
Lecture 9	Immunity to Bacteria, Virus, Fungi, Helminths and Protozoa	PC 19	Immunofluorescence reaction (IF).		
		PC 20	Enzyme immunoassay		
		PC 21	ELISA		
		PC 22	Monoclonal antibodies.		
		PC 23	Reaction of rosette formation. Determination of the number of T-lymphocytes. Determination of the number of B lymphocytes		
		PC 24	Lymphocyte blast transformation reaction.		
		PC 25	The use of allergic reactions in the diagnosis of infectious and non-infectious diseases of animals.		
		PC 26	Immune status of the body		
		PC 27	Final lesson (module #2)		

BASIC LITERATURE AND METHODOLOGICAL MATERIALS

1. Goldsby, R.A., Kindt, T., Osborne, B. and Kuby, J. (2003) *Immunology, 5th edition*, New York, W.H. Freeman.
2. Tizard I.R. *Veterinary immunology*. – 9th ed. – Elsevier, 2013. – 615p.

Electronic information resources

<https://www.youtube.com/watch?v=6fwu7AES9z8>
<https://www.youtube.com/watch?v=AomdQO0tskU>
<https://www.youtube.com/watch?v=vmlLj1aLZ7s>
<https://www.youtube.com/watch?v=oYnXeAPieN0>
<https://www.youtube.com/watch?v=h9lxx6x3HAM>
<https://www.youtube.com/watch?v=nwYlk4eB7yA>

EVALUATION SYSTEM

System		points	ACTIVITY TO BE EVALUATED
Final assessment	100 ECTS points (standard)	up to 50	50% of the average grade for the modules
		up to 50	final testing
Modular assessment	100 points totals	up to 50	answers to test questions
		up to 20	oral answers in laboratory-practical classes
		up to 30	the result of mastering the block of independent work

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 DBTU": show discipline, education, respect each other's dignity, show kindness, honesty, responsibility