SYLLABUS OF THE EDUCATIONAL COMPONENT

VETERINARY IMMUNOLOGY

speciality	**211 – Veterinary Medicine**	**Discipline status**	**mandatory**
Field of knowledge	**Veterinary Medicine**	**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 - 25 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	• 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	3 ECTS credits (90 hours): 16 hours of lectures, 34 hours of laboratory-practical classes; 40 hours of self-study, current control (2 chapters); 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	GC1. Ability to abstract thinking, analysis and synthesis. GC 2. Ability to apply knowledge in practical situations. GC 3. Knowledge and understanding of the subject field and profession. SC 6. The ability to select, pack, fix and send samples of biological material for laboratory research. SC 7. Ability to organize and conduct laboratory and special diagnostic studies and analyze their results.	Program learning outcomes	PLO 1. Know and correctly use the terminology of veterinary medicine. PLO 2. Use information from domestic and foreign sources to develop diagnostic, treatment and business strategies.

STRUCTURE OF THE EDUCATIONAL COMPONENT					
Chapter 1 Theoretical foundations of veterinary vaccinology					
Lecture 1	Introduction into immunology.	Practical classes 1 (PC 1)	Rules of work in the immunological laboratory. Study of organs of the immune system	Independent work	Theories of the development of immunology. Evolution of the immune system. Scientists-immunologists, laureates of the Nobel Prize - independent biography of an individual scientist. Types of phagocytes and their functions (neutrophils, monocytes, macrophages,
Lecture 2	The innate defense mechanisms				
Lecture 3	Basic molecules of the immune system	PC 2	Study of immunocompetent cells of various organs		
Lecture 4	The inflammatory response.	PC 3	Study of non-specific immunity factors using the		

			example of lysozyme.		SMF). Phagocytosis and complement as non-specific factors of immunity. The role of T- and B-lymphocytes in immunity. Differentiation of T-lymphocytes in the thymus. Groups of mediators and their functions (pro-inflammatory and anti-inflammatory). Superfamily of immunoglobulins (Ig). Formation and differentiation of Ig. Classes Ig. Switching classes Ig.
		PC 4	Study of phagocytic activity of neutrophils		
		PC 5	Obtaining bacterial antigens.		
		PC 6	Blood serum as a source of immunoglobulins.		
		PC 7	Obtaining hyperimmune sera.		
			Isolation of individual classes of immunoglobulins.		
Chapter 2. Clinical veterinary immunology					
Lecture 5	**Adaptive immune response. Part 1.**	**PC 8**	**Serological reactions.**	**Independent work**	**Features of the immune response to different types of antigens (AG). The role of serological research methods in infectious pathology and their features. Methods of obtaining monoclonal antibodies 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. Immunohematology: blood groups, Rhesus factor system, hemolytic disease. Hypersensitivity. Transplantation. Immunodeficiencies. Autoimmune diseases.**
			Precipitation reaction (RP) and its modifications (Ascoli reaction, RDP).		
		PC 9-10	**The phenomenon of agglutination.**		
Lecture 6	**Adaptive immune response. Part 2.**		**Qualitative agglutination reactions (RA).**		
			Quantitative agglutination reactions (RA).		
		PC 11	**Hemagglutination reactions (RHA, RZHA, RNHA)**		
Lecture 7	**REGULATION OF ADAPTIVE IMMUNITY**	**PC 12**	**Complement binding reaction (CRF).**		
			Neutralization reaction (PH)		
		PC 13	**The phenomenon of labels.**		
Lecture 8	**Immunity to Bacteria, Virus, Fungi, Helminths and Protozoa**		**Immunofluorescence reaction (IF).**		
		PC 14	**Enzyme immunoassay**		
			ELISA		
		PC 15	**Monoclonal antibodies.**		
		PC 16	**Reaction of rosette formation. Determination of the number of T-lymphocytes. Determination of the number of B lymphocytes**		
		PC 17	**Immune status of the body. Final lesson**		

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

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.