EDUCATIONAL COMPONENT SYLLABUS

SPERMATOLOGY

specialty	**211 – Veterinary medicine**	**the obligation of discipline**	**selective component**
educational program	**veterinary medicine**	**faculty**	**veterinary medicine**
educational level	**Master's degree**	**department**	**veterinary surgery and reproduction**

LECTURERS

Fedorenko Serhii Yakovych

Higher education – Kharkiv Zooveterinary Institute, 1999, specialist, qualification – doctor of veterinary medicine.
Scientific degree - Doctor of Veterinary Sciences, specialty 16.00.07 - Veterinary obstetrics
Academic rank – Professor
Work experience – 25 years
Indicators of professional activity on the course topic:

- Co-author of 2 textbooks and 6 methodological recommendations;
- 20 years of scientific experience;
- co-author of thematic publications in the scientometric database Web of Science (more than 10).

phone	**0973558575**	**e-mail**	**fedorenkoserg1977@gmail.com**	**remote support**	**Moodle**

Naumenko Svitlana Valeriivna

Higher education – Kharkiv State Zooveterinary Academy, 2005, specialist, qualification – doctor of veterinary medicine.
Scientific degree - Doctor of Veterinary Sciences, specialty 16.00.07 - Veterinary obstetrics
Academic rank – Professor
Work experience – 20 years
Indicators of professional activity on the course topic:

- author of over 140 scientific works, including 13 articles included in the scientometric database Scopus and Web of Science, 114 articles in scientific professional publications of Ukraine, 2 textbooks, 4 monographs and 2 chapters of collective monographs, 46 abstracts of reports from international and all-Ukrainian scientific and practical conferences, 8 scientific and methodological recommendations and 2 technical conditions for veterinary drugs;
- 20 years of scientific experience.

phone	**0979842762**	**e-mail**	**0979842762@btu.kharkov.ua**	**remote support**	**Moodle**

Siehodin Oleksandr Borysovych

Higher education – Kharkiv Zooveterinary Institute, 2001, specialist, qualification – doctor of veterinary medicine.
Scientific degree – Candidate of Veterinary Sciences (Ph.D.), specialty 16.00.05 – Veterinary surgery
Academic rank – Docent
Work experience – 24 years
Indicators of professional activity on the course topic:

- author and co-author of over 30 scientific works, including: textbooks in English – 3; chapter in a collective monograph – 1, patent for a utility model – 1;
- 20 years of scientific experience.

phone	**0979118636**	**e-mail**	**0979118636@btu.kharkov.ua**	**remote support**	**Moodle**

Koshevoi Vsevolod Ihorovych

Higher education – Kharkiv State Zooveterinary Academy, 2019, Master of science, qualification – doctor of veterinary medicine.
Scientific degree – Doctor of Philosophy, specialty – 211 Veterinary medicine, State Biotechnological University, 2023.
Work experience – 2 years
Indicators of professional activity on the course topic:

- author of over 100 scientific works, including 6 articles included in the scientometric database Scopus, 45 articles in scientific professional publications of Ukraine (including 16 in English), 1 monograph and 2 chapters of collective monographs, 42 abstracts of reports of international and all-Ukrainian scientific and practical conferences, 6 scientific and methodological recommendations and 1 technical conditions for a veterinary drug;
- 10 years of scientific experience;
- reviewer of scientific articles in journals included in international scientometric databases (Scopus – World's Veterinary Journal; Web of Science – Uttar Pradesh Journal of Zoology; etc.).

phone	**0630757540**	**e-mail**	**koshevoyvsevolod@gmail.com**	**remote support**	**Moodle**

GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT

Goal	The purpose of studying the selective component "Spermatology" is to enable higher education students to acquire modern data on the structure of male gametes of various animal species, their physical, chemical, and biological features, their importance in the transmission of genetic material, and innovative means of assessing their fertilizing ability and correcting their metabolism under different environmental conditions.
Format	lectures, practical classes, independent work, individual assignments.
Scope and forms of control	3 ECTS credits (90 hours): 12 hours of lectures, 18 hours of laboratory work, 60 hours of independent work; current control (2 chapters); final control – differentiated test.
Teacher requirements	timely completion of independent work, presentations, activity, teamwork
Enrollment conditions	according to the curriculum

COMPLEMENTS THE STANDARD OF EDUCATION AND THE EDUCATIONAL PROGRAM

Competences	**general competences:** GC 7. Ability to conduct research at an appropriate level. GC 8. Ability to learn and master modern knowledge. **special competences:** SC 1. The ability to establish the features of the structure and functioning of cells, tissues, organs, their systems and apparatuses of the body of animals of different classes and species - mammals, birds, insects (bees), fish and other vertebrates. SC 2. Ability to use tools, special devices, instruments, laboratory equipment and other technical means to perform the necessary manipulations during professional activities.	**Program learning outcomes**	This academic discipline ensures the formation of the following **program learning outcomes**: PLO 3. Determine the essence of physicochemical and biological processes that occur in the animal body normally and during pathology; PLO 7. Formulate conclusions regarding the effectiveness of selected methods and means of keeping, feeding and treating animals, prevention of infectious and non-infectious diseases, as well as production and technological processes at enterprises for keeping, breeding or operating animals of various classes and species; PLO 10. Propose and use appropriate innovative methods and approaches to solving problem situations of professional origin.

STRUCTURE OF THE EDUCATIONAL COMPONENT

Chapter 1. Molecular and biological features of male germ cells, formation and assessment of their fertilizing ability

LECTURES	**Laboratory and practical lesson**	**Independent**	Overview of spermatogonial stem cells Terms of spermatogenesis in different

Lecture 1	Growth and development of male germ cells – from the embryonic period to mature sperm: morphological characteristics, influence of factors and regulatory mechanisms	**LPL 1**	Sperm as carriers of hereditary information		animal species Scheme of spermatogenesis Characteristics of the main intracellular enzymes of sperm Review of the enzymatic composition of the sperm plasma Chromosome set of mature sperm Acrosomal enzymes and their significance Sperm mitochondria – an energy miracle Radiation energy and damage to male germ cells Toxic factors and the fertilizing ability of sperm
Lecture 2	Sperm biology – chemical and physical processes in the life of gametes	**LPL 2**	Chemical composition of sperm of different animal species		
Lecture 3	Fertilizing ability of sperm: mechanisms of formation and maintenance, influencing factors, assessment and preservation	**LPL 3**	Sperm movement and energetics and their biological significance		
		LPL 4	Assessment of sperm fertilizing ability		
Chapter 2. Antioxidant regulation of spermatogenesis, sperm viability and means of its correction					
Lecture 4	Regulation of spermatogenesis in animals: hormonal-metabolic processes, ATA-mediated changes, genetically determined factors	**LPL 5**	Antioxidant potential of male gametes	**Independent work**	Products of free radical oxidation and their effects Oxidative modification of proteins and peroxidative oxidation of lipids of male gametes Factors protecting sperm from oxygen radicals 8-Deoxyguanosine as a marker of DNA damage Nucleic acids and their metabolism in sperm Classification of antioxidants Possibilities of antioxidant protection of sperm The influence of environmental conditions on the redox potential of sperm Biochemical features of the existence of sperm in the female genital tract Molecular mechanisms of penetration of male gametes into the egg
		LPL 6	Oxidative stress and its effects on sperm		
Lecture 5	Free radical oxidation of biological substrates of mature sperm: risks, mechanisms, means of detection	**LPL 7**	Sources of antioxidant protection for sperm		
Lecture 6	Fundamentals of the use of antioxidant substances to increase sperm viability under different environmental conditions	**LPL 8**	Innovative extenders for sperm dilution and storage and their components		
		LPL 9	Hormonal and metabolic status of the male and its antioxidant correction		
BASIC LITERATURE AND METHODOLOGICAL MATERIALS					

Basic and additional literature	1. Biotekhnolohichni i molekuliarno-henetychni osnovy vidtvorennia tvaryn / [V.A. Yablonskyi, S.P. Khomyn, V.I. Zaviriukha ta in.] ; pid zah. red. Yablonskoho V.A., O.I. Serhiienka ta R.S. Stoika. – Lviv: TzOV "VF «Afisha»", 2009. – 218 s.: il. 2. Fiziolohiia ta patolohiia rozmnozhennia dribnykh tvaryn : navchalnyi posibnyk / [M.I. Kharenko, S.P. Khomyn, V.P. Koshovyi ta in.] ; pid zah. red. M.I. Kharenka. – Sumy : VAT «Sumska oblasna drukarnia», vydavnytstvo «Kozatskyi val», 2005. – 555 s. 3. Sperma buhaiv natyvna. Tekhnichni umovy : DSTU 3535-97. – K.: Derzhstandart Ukrainy, 1998. –24 s.	**Methodical support**	1. Skliarov P.M. Biotekhnolohiia vidtvorennia sobak i kotiv: navchalnyi posibnyk. Dnipro: FOP Shliupenkov O.A., 2022. 92 s. 2. Koshevoi V.I. Sposib korektsii neplidnosti knuriv nanochastynkamy hadoliniiu ortovanadatu: naukovo-metodychni rekomendatsii / Koshevoi V.I., Naumenko S.V., Klochkov V.K., Yefimova S.L., Skliarov P.M. Kyiv, 2022. 32 s. 3. Liubetskyi M.D. Orhanizatsiia i tekhnika vidtvorennia silskohospodarskykh tvaryn / Liubetskyi M.D., Khokhlov A.M., Koshovyi V.P. – K.: Vyshcha shkola, 1984. – 145 s.

EVALUATION SYSTEM

SYSTEM		POINTS	ACTIVITY THAT IS ASSESSED
Final assessment (different credit, exam)Final evaluation	**100 ECTS points (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 stipulated in the regulation "On Academic Integrity of Participants in the Educational Process of SBTU": to demonstrate discipline, good manners, respect each other's dignity, show kindness, honesty, and responsibility.