



Animal physiology I
Educational subject description sheet

Basic information

Field of study Veterinary Medicine	Education cycle 2020/21	
Speciality -	Subject code WMWMMW-AJS.J4HS.0076.20	
Department The Faculty of Veterinary Medicine	Lecture languages English	
Study level Long-cycle programme	Mandatory mandatory	
Study form Full-time	Block humanities and social sciences	
Education profile General academic	Disciplines Veterinary medicine	
	Subject related to scientific research No	
	Subject shaping practical skills Yes	
Teacher responsible for the subject	Bożena Króliczewska	
Other teachers conducting classes	Bożena Króliczewska, Jolanta Bujok	
Period Semester 3	Examination graded credit	Number of ECTS points 4.0
	Activities and hours lecture: 30 laboratory classes: 45	
	Standard group A. Basic sciences	

Goals

C1	To acquaint students with physiological processes occurring in living organisms at the cellular and tissue levels.
C2	Transfer of knowledge about the function of systems and organs as well as the regulatory mechanisms associated with maintaining their homeostasis.
C3	Introduction students to selected diagnostic methods

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge - Student knows and understands:			
W1	knows to an extensive degree and understands the structure of the animal organism: cells, tissues, organs and systems	A.W1	written credit, project, observation of student's work, presentation, test, participation in discussion, performing tasks, case study
W2	knows to an extensive degree, describes in detail and explains the structure, activity and regulation mechanisms of organs and systems of the animal organism (respiratory, digestive, circulatory, excretory, nervous, reproductive, hormonal, immune system and skin), as well as their integration at the organism level;	A.W2	written credit, project, observation of student's work, presentation, test, participation in discussion, performing tasks, case study
W3	presents the development of organs and the entire animal organism in relation to the mature organism	A.W3	written credit, project, observation of student's work, presentation, test, participation in discussion, performing tasks, case study
W4	characterises in detail the metabolic processes at the molecular, cellular, organ and system levels	A.W4	written credit, project, observation of student's work, presentation, test, participation in discussion, performing tasks, case study
W5	knows to an extensive degree and understands the principles of water and electrolyte metabolism, acid-base balance of animal organism, as well as the mechanism of system homeostasis;	A.W5	written credit, project, observation of student's work, presentation, test, participation in discussion, performing tasks, case study
W6	presents the physical laws describing flow of fluids and factors affecting vascular resistance of blood flow;	A.W7	written credit, project, observation of student's work, presentation, test, participation in discussion, performing tasks, case study
W7	describes in detail the mechanism of neurohormonal regulation, reproduction, aging and death	A.W9	written credit, project, observation of student's work, presentation, test, participation in discussion, performing tasks, case study

W8	knows to an extensive degree and understands the physicochemical and molecular foundations of the operation of sensory organs	A.W8	written credit, project, observation of student's work, presentation, test, participation in discussion, performing tasks, case study
Skills - Student can:			
U1	describes changes in functioning of the organism in the situation of homeostasis disorders	A.U4	written credit, project, observation of student's work, presentation, participation in discussion, performing tasks, case study
U2	defines physiological state as the animal's adaptation to the changing environmental factors	A.U7	written credit, project, observation of student's work, presentation, participation in discussion, performing tasks, case study
U3	recognises (in the images from optical microscope) histological structures corresponding to organs, tissues and cells, and is able to formulate their description, interpret their structure and relations between their structure and activity, taking into account the animal species from which they originate;	A.U8	written credit, project, observation of student's work, presentation, participation in discussion, performing tasks, case study
U4	understands the need of continuing education, in order to ensure continuous professional development	A.U21	written credit, project, observation of student's work, presentation, participation in discussion, performing tasks, case study
Social competences - Student is ready to:			
K1	uses the objective sources of information	O.K4	project, presentation, test, performing tasks, case study
K2	formulates conclusions from own measurements or observations	O.K5	project, presentation, test, performing tasks, case study
K3	is ready for reliable self-assessment, formulating constructive criticism in the scope of veterinary practice, accepting criticism of presented solutions, reacting to such criticism in a clear and material manner, also with the use of arguments referring to the available scientific achievements in the discipline;	O.K7	project, presentation, test, performing tasks, case study
K4	deepens his/her knowledge and improves skills	O.K8	project, presentation, test, performing tasks, case study
K5	communicates with the co-workers and shares knowledge	O.K9	project, presentation, test, performing tasks, case study

Balance of ECTS points

Activity form	Activity hours*
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lecture	30
laboratory classes	45
consultations	10
class preparation	20
presentation/report preparation	10
Student workload	
	Hours 115
	ECTS 4.0
Workload involving teacher	
	Hours 85
	ECTS 3.0
Practical workload	
	Hours 45
	ECTS 1.7

* hour means 45 minutes

Study content

No.	Course content	Activities
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1.	<p>Lecture 1-2: Biological definition of life, functional organization of living organisms, physiology of the cell</p> <p>Lecture 3-4: Body compartments, homeostasis and principles of regulatory systems in the multicellular organisms</p> <p>Lecture 5-6: Nervous system physiology 1 - General physiology of the nervous system</p> <p>Lecture 7-8: Nervous system physiology 2 - Central nervous system physiology</p> <p>Lecture 9-10: Nervous system physiology 3 - Sensory nervous system physiology</p> <p>Lecture 11-12: Nervous system physiology 4 - Motor nervous system physiology</p> <p>Lecture 13-14: Nervous system physiology 5 - Autonomic nervous system physiology</p> <p>Lecture 15-16: Special senses physiology 1</p> <p>Lecture 17-18: Special senses physiology 2</p> <p>Lecture 19-20: Endocrine system physiology 1 - Endocrine system organisation, general aspects of endocrine system physiology, hypothalamus and pituitary gland</p> <p>Lecture 21-22: Endocrine system physiology 2 - Thyroid gland and Adrenal cortex</p> <p>Lecture 23-24: Endocrine system physiology 3 - Adrenal medulla, exocrine pancreas</p> <p>Lecture 25-26: Cardiovascular system physiology 1 - General aspects of circulation</p> <p>Lecture 27-28: Cardiovascular system physiology 2 - Neurohumoral regulation</p> <p>Lecture 29-30: Cardiovascular system physiology 3 - Circulation in particular organ systems</p>	lecture
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2.	<p>Laboratory 1. Physiological properties of striated and smooth muscles. Skeletal muscle twitch: recording the single muscle twitch, recording the incomplete tetanus and complete tetanus. Recording the smooth muscle twitch. Muscle contraction types: isotonic, isometric and auxotonic. Determination of absolute skeletal muscle strength.</p> <p>Laboratory 2. Resting and action potentials. Analysis of reflex arc. Examination of reflexes in human and animals. Stenson's experiment.</p> <p>Laboratory 3. Excitation and inhibition processes in Central Nervous System. Animal hypnosis. Experiment with strychnine. Skin receptors - examination.</p> <p>Laboratory 4. Physiological properties of cardiac muscle. Cardiogram. Effect of hormones, thermal factor and vagus nerve on heart rate. Blood flow in vessels. Localization of venous valves.</p> <p>Laboratory 5. Structure and function of cardiac conduction system. Cardiac cycle. Auscultation of heart sounds. Test pulse rate. Recording of pulse curve</p> <p>Laboratory 6. Electrocardiography. Analysis of electrocardiograms. Activities of heart</p> <p>Laboratory 7. Test (lab. 1-6). Solving problem tasks from converted material</p> <p>Laboratory 8. Measurement of blood pressure. Examination of the cardiovascular system: Nervous and humoral regulation of blood pressure. Analysis of blood pressure curve. Circulation blood.</p> <p>Laboratory 9. Spirometry. Recording of respiratory movements of chest. Mechanism of lung ventilation.</p> <p>Laboratory 10. Determination of respiratory rate before and after exercise. Mechanism of respiratory regulation. Examination of the respiratory system.</p> <p>Laboratory 11. Birds respiratory system - composition and function. Analysis of selected parameters from exercise physiology in humans and animals</p> <p>Laboratory 12. Physiology of female reproductive system. Pregnancy and parturition. Evaluation of canine vaginal cytology during the estrus cycle.</p> <p>Laboratory 13. Physiology of male reproductive system. Effect of temperature and pH on spermatozoa activity</p> <p>Laboratory 14. Urine composition. Determining of physical properties of urine. Chemical properties of urine - evaluation using commercial test strips.</p> <p>Laboratory 15. Test (lab. 8-14). Solving problem tasks from converted material Protocols correction and final evaluation. Credit.</p>	laboratory classes
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Course advanced

Teaching methods:

case analysis, educational film, problem-solving method, project-based learning (PBL), presentation / demonstration, teamwork, discussion, lecture, classes

Activities	Examination methods	Percentage in subject assessment
lecture	written credit	50%

Activities	Examination methods	Percentage in subject assessment
laboratory classes	written credit, project, observation of student's work, presentation, test, participation in discussion, performing tasks, case study	50%

Literature

Obligatory

1. 1. Cunningham's Textbook of Veterinary Physiology, Bradley G. Klein, Fifth Ed. Elsevier, 2013
2. 2. Dukes' Physiology of Domestic Animals, 13th Edition. William O. Reece (Editor), Howard H. Erickson (Associate Editor), Jesse P. Goff (Associate Editor), Etsuro E. Uemura (Associate Editor), Wiley-Blackwell, 2015
3. 3. Physiology of Domestic Animals - Oystein V. Sjaastad, Knut Hove, Olav Sand, Scandinavian Veterinary Press, 2010
4. 4. Guyton and Hall Textbook of Medical Physiology, John E. Hall, 13th-Ed, Elsevier Books 2015.

Optional

1. 1. Eckert Animal Physiology by David Randall, Warren Burggren, Kathleen French
2. 2. Anatomy and Physiology of Domestic Animals, 2nd Ed., R. Michael Akers, D. Michael Denbow, Wiley-Blackwell, 2013.
3. 3. Sturkie's Avian Physiology, 6th Ed., 2014.

Effects

Code	Content
A.U4	Describes changes in functioning of the organism in the situation of homeostasis disorders
A.U7	Defines physiological state as the animal's adaptation to the changing environmental factors
A.U8	Recognises (in the images from optical microscope) histological structures corresponding to organs, tissues and cells, and is able to formulate their description, interpret their structure and relations between their structure and activity, taking into account the animal species from which they originate;
A.U21	Understands the need of continuing education, in order to ensure continuous professional development
A.W1	Knows to an extensive degree and understands the structure of the animal organism: cells, tissues, organs and systems
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A.W3	Presents the development of organs and the entire animal organism in relation to the mature organism
A.W4	Characterises in detail the metabolic processes at the molecular, cellular, organ and system levels
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A.W8	Knows to an extensive degree and understands the physicochemical and molecular foundations of the operation of sensory organs
A.W9	Describes in detail the mechanism of neurohormonal regulation, reproduction, aging and death
O.K4	Uses the objective sources of information
O.K5	Formulates conclusions from own measurements or observations
O.K7	Is ready for reliable self-assessment, formulating constructive criticism in the scope of veterinary practice, accepting criticism of presented solutions, reacting to such criticism in a clear and material manner, also with the use of arguments referring to the available scientific achievements in the discipline;
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