



Animal physiology I  
Educational subject description sheet

**Basic information**

<b>Field of study</b> Veterinary Medicine	<b>Education cycle</b> 2023/24	
<b>Speciality</b> -	<b>Subject code</b> MD000000MWW-AJS.J4B.0076.23	
<b>Organizational unit</b> The Faculty of Veterinary Medicine	<b>Lecture languages</b> english	
<b>Study level</b> Long-cycle programme	<b>Mandatory</b> mandatory	
<b>Study form</b> Full-time	<b>Block</b> major subjects	
<b>Education profile</b> General academic	<b>Disciplines</b> Veterinary medicine	
	<b>Subject related to scientific research</b> Yes	
	<b>Subject shaping practical skills</b> Tak	
<b>Teacher responsible for the subject</b>	Bożena Króliczewska	
<b>Other teachers conducting classes</b>	Bożena Króliczewska, Jolanta Bujok	
<b>Period</b> Semester 3	<b>Examination</b> graded credit	<b>Number of ECTS points</b> 4.0
	<b>Activities and hours</b> lecture: 30 laboratory classes: 45	
	<b>Standard groups</b> A. Basic sciences, B. Professional knowledge	

## Goals

C1	The subject of Animal physiology provides knowledge about the processes occurring in living organisms at the cellular and organ level and their regulation.
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### Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
<b>Knowledge - Student knows and understands:</b>			
W1	the way of functioning of individual cell structures/systems / organs such as central and peripheral nervous system, smooth and skeletal muscles, heart muscle, circulatory system, respiratory system, excretory system, reproductive system.	O.W2	written credit, oral credit, presentation, test, participation in discussion, performing tasks, case study
W2	the action of mechanisms regulating the activities of the animal organism's nervous, motor, circulatory, respiratory, excretory, and reproductive systems.	A.W2	written credit, oral credit, presentation, test, participation in discussion, performing tasks, case study
W3	mechanisms integrating the functioning of the organism and maintaining the organism's homeostasis (CNS, AUN, neurotransmitters in the nervous system, neurohormonal regulation, circulatory system).	A.W9	written credit, oral credit, presentation, test, participation in discussion, performing tasks, case study
<b>Skills - Student can:</b>			
U1	indicate how the discussed organs / systems can influence each other and what are the consequences for the functioning of the organism.	A.U7	written credit, test, participation in discussion, performing tasks, case study
U2	explains the physiological mechanisms of sensation and perception, movement and maintenance of body posture, the physiological basis of behavior, endocrinology (hypothalamic-pituitary axis, peripheral endocrine glands, and tissue hormones), regulation of blood flow in the vessels, gas exchange.	A.U4	written credit, presentation, test, participation in discussion, performing tasks, case study
U3	performs tests of parameters determining the physiological state of the body: the nervous system (reflexes), physiological parameters of the circulatory system (blood pressure, heart rate, auscultation of heart tones, ECG), spirometry, urine tests.	O.U2	written credit, observation of student's work, presentation, test, participation in discussion, performing tasks, case study
<b>Social competences - Student is ready to:</b>			
K1	assessment and interpretation of the body's functioning based on the measurements of physiological parameters concerning the nervous system, skeletal and smooth muscles, circulatory system, sensory organs, and respiratory system.	O.K5	observation of student's work, participation in discussion, case study
K2	approaches knowledge critically and constantly updates it with the latest state of general knowledge, using scientific sources to expand their knowledge.	O.K8	observation of student's work, participation in discussion, case study

K3	is willing to cooperate - to consult others and share his knowledge with others.	O.K9	observation of student's work, participation in discussion, case study
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### Balance of ECTS points

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

\* hour means 45 minutes

### Study content

No.	Course content	Activities
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1.	<ol style="list-style-type: none"> <li>1. Biological definition of life, functional organization of living organisms, physiology of the cell.</li> <li>2. Body compartments, homeostasis and principles of regulatory systems in the multicellular organisms.</li> <li>3. Nervous system physiology 1 - General physiology of the nervous system.</li> <li>4. Nervous system physiology 2 - Central nervous system physiology.</li> <li>5. Nervous system physiology 3 - Sensory nervous system physiology.</li> <li>6. Nervous system physiology 4 - Motor nervous system physiology.</li> <li>7. Nervous system physiology 5 - Autonomic nervous system physiology.</li> <li>8. Special senses physiology 1.</li> <li>9. Special senses physiology 2.</li> <li>10. Endocrine system physiology 1 - Endocrine system organisation, general aspects of endocrine system physiology, hypothalamus and pituitary gland.</li> <li>11. Endocrine system physiology 2 - Thyroid gland and Adrenal cortex.</li> <li>12. Endocrine system physiology 3 - Adrenal medulla, exocrine pancreas.</li> <li>13. Cardiovascular system physiology 1 - General aspects of circulation.</li> <li>14. Cardiovascular system physiology 2 - Neurohumoral regulation.</li> <li>15. Cardiovascular system physiology 3 - Circulation in particular organ systems.</li> </ol>	lecture
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2.	<p>1. Resting and action potentials. Functions of peripheral nerves. Nerve transmission.</p> <p>2. Analysis of reflex arc. Examination of reflexes in humans and animals. Stenson's experiment.</p> <p>3. Excitation and inhibition processes in Central Nervous System. Animal hypnosis. Experiment with strychnine. Skin receptors - examination.</p> <p>4. Physiological properties of striated and smooth muscles. Skeletal muscle twitch: recording the single muscle twitch, recording 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>5. Physiological properties of cardiac muscle. Cardiac action potential. Structure and functions of the mammalian cardiac conducting system. Stannius' Ties. Cardiogram. Effect of hormones, thermal factor and vagus nerve on heart rate. Blood flow in vessels. Localization of venous valves.</p> <p>6. Cardiac cycle - hemodynamics. Auscultation of heart sounds. Test pulse rate. Recording of pulse curve.</p> <p>7. Electrocardiography.</p> <p>8. Test (lab. 1-7). Solving problem tasks from learned material.</p> <p>9. Measurement of blood pressure. Nervous regulation of blood pressure.</p> <p>10. Spirometry. Mechanism of lung ventilation in mammals and birds.</p> <p>11. Recording of chest breathing movements. Determination of respiratory rate before and after exercise. Mechanism of respiratory regulation. Examination of the respiratory system.</p> <p>12. Analysis of selected parameters of exercise physiology in humans and animals. Practical activities with animals.</p> <p>13. Estrus cycle and estrus in animals. Evaluation of canine vaginal cytology.</p> <p>14. Urine composition. Determining of physical properties of urine. Chemical properties of urine - evaluation using commercial test strips.</p> <p>15. Test (lab. 9-14). Solving problem tasks from learned 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, computer lab/laboratory, discussion, lecture, classes, brainstorming

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

### **Entry requirements**

Cell biology, Chemistry, Biophysics, Animal anatomy I and II, Biochemistry I, Histology and embryology I and II

### **Literature**

#### **Obligatory**

1. Cunningham's Textbook of Veterinary Physiology, Bradley G. Klein, Fifth Ed. Elsevier, 2013
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. Physiology of Domestic Animals - Oystein V. Sjaastad, Knut Hove, Olav Sand, Scandinavian Veterinary Press, 2010
4. Guyton and Hall Textbook of Medical Physiology, John E. Hall, 13th-Ed, Elsevier Books, 2015.

#### **Optional**

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

## Kierunkowe efekty uczenia się

Kod	Treść
O.K5	Formulates conclusions from own measurements or observations
O.K8	Deepens his/her knowledge and improves skills
O.K9	Communicates with the co-workers and shares knowledge
O.U2	Analyses and interprets pathological changes and results of laboratory tests and additional tests, formulates the diagnosis of given disease, taking into account the differential diagnostics, and undertakes therapeutic or prophylactic actions;
O.W2	Knows to an extensive degree, describes in detail and explains the development, structure, functioning, behaviours and physiological mechanisms of animals in normal conditions, as well as the mechanisms of disorders in pathological conditions;
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.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.W9	Describes in detail the mechanism of neurohormonal regulation, reproduction, aging and death