

UNIVERSITY OF ZAGREB
FACULTY OF VETERINARY MEDICINE

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Division: Basic and preclinical science division

Organizational unit: Physiology and Radiobiology

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Register No of the organisational unit:

Zagreb, 11/02/2025

	
198024	REPUBLIKA HRVATSKA
Veterinarski fakultet u Zagrebu	
Primljeno:	11.02.2025
Klasifikacijska oznaka	Org. jed.
602-04/24-22/38	251-61-41; 251-61-32;
Uredžbeni broj	Prilozi Vrijednost
251-61-06-25-136	0 -

COURSE SYLLABUS

Course name: **Physiology of domestic animals II**

Academic year 2024/2025

Course leader: Assoc. Prof., Ana Shek Vugrovečki
Deputy course leader: Assoc. Prof., Ivona Žura Žaja

Teachers: Full Prof., Jasna Aladrović; Assoc. Prof., Lana Pađen; Assoc. Prof. Ana Shek Vugrovečki; Assoc. Prof. Ivona Žura Žaja;
Assist. prof. Jadranka Pejaković Hlede; teaching assistant Stefani Fruk; teaching assistant Josip Miljković

First day of classes: 04/03/2025

Last day of classes: 11/06/2025

Activities - Physiology of Domestic Animals II (1/5)

Start Date	Start T	End Ti	Subject	Group	Note	Length	Instructor	Room
04/03/2025	14:00	15:30	p01 Carbohydrate metabolism	4E-1, 4E-2, 4E-3		1:30	Shek Vugrovecki A.	P_fiziologija
05/03/2025	10:00	11:30	p02 Protein metabolism	4E-1, 4E-2, 4E-3		1:30	Paden L.	P_farmakologija
06/03/2025	10:00	11:30	p03 Lipid metabolism	4E-1, 4E-2, 4E-3		1:30	Žura Žaja I.	P_farmakologija
07/03/2025	12:00	13:30	p04 Vitamins metabolism	4E-1, 4E-2, 4E-3		1:30	Žura Žaja I.	P_farmakologija
11/03/2025	14:30	16:00	s01 Lipid metabolism	4E-1, 4E-2, 4E-3		1:30	Žura Žaja I.	P_farmakologija
12/03/2025	11:30	14:45	v01 Serum CH & protein analysis	4E-1, 4E-2		3:15	Nastavnici na predmetu	V_fiziologija
13/03/2025	8:15	11:30	v01 Serum CH & protein analysis	4E-3		3:15	Nastavnici na predmetu	V_fiziologija
14/03/2025	11:30	13:00	p05 Minerals metabolism	4E-1, 4E-2, 4E-3		1:30	Shek Vugrovecki A.	P_fiziologija
17/03/2025	11:30	14:45	v02 Serum lipids and hepatic enzymes analysis	4E-1, 4E-2		3:15	Nastavnici na predmetu	V_fiziologija
20/03/2025	11:00	14:15	v02 Serum lipids and hepatic enzymes analysis	4E-3		3:15	Nastavnici na predmetu	V_fiziologija
21/03/2025	9:00	9:45	p08 Egg-laying physiology	4E-1, 4E-2, 4E-3		0:45	Aladrovic J.	P_fiziologija
24/03/2025	13:30	15:00	p06 Mammary gland 1	4E-1, 4E-2, 4E-3		1:30	Paden L.	P_fiziologija
24/03/2025	15:15	16:00	p07 Mammary gland 2	4E-1, 4E-2, 4E-3		0:45	Paden L.	P_fiziologija
25/03/2025	8:15	9:45	s04 Exercise physiology	4E-1, 4E-2, 4E-3		1:30	Shek Vugrovecki A.	P_farmakologija
26/03/2025	8:15	9:45	p09 Cardiovascular system 1	4E-1, 4E-2, 4E-3		1:30	Žura Žaja I.	P_fiziologija
27/03/2025	10:00	13:15	v03 Exercise physiology	4E-3		3:15	Nastavnici na predmetu	V_fiziologija
28/03/2025	9:45	13:00	v03 Exercise physiology	4E-1, 4E-2		3:15	Nastavnici na predmetu	V_fiziologija
28/03/2025	13:30	15:00	p10 Cardiovascular system 2	4E-1, 4E-2, 4E-3		1:30	Žura Žaja I.	P_fiziologija

Activities - Physiology of Domestic Animals II (2/5)

Start Date	Start T	End Ti	Subject	Group	Note	Length	Instructor	Room
31/03/2025	10:00	11:30	s03 Bioenergetics	4E-1, 4E-2, 4E-3		1:30	Shek Vugrovecki A.	P_fiziologija
01/04/2025	12:30	14:00	p11 Cardiovascular system 3	4E-1, 4E-2, 4E-3		1:30	Žura Žaja I.	P_fiziologija
02/04/2025	9:15	12:30	v04 Behaviour physiology	4E-1, 4E-2		3:15	Nastavnici na predmetu	V_fiziologija
04/04/2025	10:00	11:30	s05 Cardiovascular system	4E-1, 4E-2, 4E-3		1:30	Žura Žaja I.	P_fiziologija
07/04/2025	13:15	16:30	v04 Behaviour physiology	4E-3		3:15	Nastavnici na predmetu	V_fiziologija
09/04/2025	9:00	10:30	p12 Cardiovascular system 4	4E-1, 4E-2, 4E-3		1:30	Žura Žaja I.	P_fiziologija
11/04/2025	9:00	12:15	v05 ECG, Bipolar ECG recording	4E-3		3:15	Nastavnici na predmetu	V_fiziologija
11/04/2025	12:45	16:00	v05 ECG, Bipolar ECG recording	4E-1, 4E-2		3:15	Nastavnici na predmetu	V_fiziologija
14/04/2025	14:15	15:00	s06 Circulatory system	4E-1, 4E-2, 4E-3		0:45	Paden L.	P_velika
15/04/2025	9:00	12:15	v06 Cardiovascular system physiology	4E-3		3:15	Nastavnici na predmetu	R_porodništvo
15/04/2025	12:30	15:45	v06 Cardiovascular system physiology	4E-1, 4E-2		3:15	Nastavnici na predmetu	R_porodništvo
16/04/2025	10:00	10:45	p13 Excretory function of kidneys 1	4E-1, 4E-2, 4E-3		0:45	Aladrovic J.	P_fiziologija
16/04/2025	10:45	11:30	p14 Excretory function of kidneys 2	4E-1, 4E-2, 4E-3		0:45	Aladrovic J.	P_fiziologija
22/04/2025	8:45	12:00	v07 Blood pressure measurement	4E-3		3:15	Nastavnici na predmetu	V_fiziologija
24/04/2025	8:00	11:15	v07 Blood pressure measurement	4E-1, 4E-2		3:15	Nastavnici na predmetu	V_fiziologija

Activities - Physiology of Domestic Animals II (3/5)								
Start Date	Start T	End Ti	Subject	Group	Note	Length	Instructor	Room
06/05/2025	13:00	13:45	s07 Physiology of scenescence, oxidanta and antioxi. system	4E-1, 4E-2, 4E-3		0:45	Aladrovic J.	P_fiziologija
08/05/2025	8:15	9:00	p15 Urine formation 1	4E-1, 4E-2, 4E-3		0:45	Aladrovic J.	P_fiziologija
08/05/2025	9:15	12:30	v08 Reproduction	4E-3		3:15	Nastavnici na predmetu	V_fiziologija
08/05/2025	12:45	16:00	v08 Reproduction	4E-1, 4E-2		3:15	Nastavnici na predmetu	V_fiziologija
09/05/2025	10:30	12:00	p16 Urine formation 2	4E-1, 4E-2, 4E-3		1:30	Aladrovic J.	P_fiziologija
09/05/2025	12:00	13:30	p17 Respiratory system 1	4E-1, 4E-2, 4E-3		1:30	Shek Vugrovecki A.	P_fiziologija
09/05/2025	13:45	17:00	v09 Kidneys-urine analysis	4E-1, 4E-2		3:15	Nastavnici na predmetu	V_fiziologija
13/05/2025	8:15	11:30	v09 Kidneys-urine analysis	4E-3		3:15	Nastavnici na predmetu	V_fiziologija
15/05/2025	11:15	12:45	p18 Respiratory system 2	4E-1, 4E-2, 4E-3		1:30	Shek Vugrovecki A.	P_fiziologija
16/05/2025	10:00	13:15	v10 Renal excretion	4E-1, 4E-2, 4E-3		3:15	Nastavnici na predmetu	R_stocarstvo mala, R_stocarstvo velika
16/05/2025	13:30	15:00	p19 Digestion 1	4E-1, 4E-2, 4E-3		1:30	Shek Vugrovecki A.	P_fiziologija
19/05/2025	8:15	11:30	v11 Spirometry	4E-1, 4E-2		3:15	Nastavnici na predmetu	V_fiziologija
19/05/2025	12:00	15:15	v11 Spirometry	4E-3		3:15	Nastavnici na predmetu	V_fiziologija
20/05/2025	8:15	9:45	p20 Digestion 2	4E-1, 4E-2, 4E-3		1:30	Shek Vugrovecki A.	P_fiziologija
21/05/2025	8:15	9:45	s09 Respiratory system	4E-1, 4E-2, 4E-3		1:30	Shek Vugrovecki A.	P_farmakologija
21/05/2025	10:00	11:30	p21 Rumen digestion 1	4E-1, 4E-2, 4E-3		1:30	Shek Vugrovecki A.	P_fiziologija

Activities - Physiology of Domestic Animals II (4/5)

Start Date	Start T	End Ti	Subject	Group	Note	Length	Instructor	Room
22/05/2025	11:15	12:45	p22 Rumen digestion 2	4E-1, 4E-2, 4E-3		1:30	Aladrovic J.	P_fiziologija
22/05/2025	13:00	16:15	v12 Oral digestion	4E-3		3:15	Nastavnici na predmetu	V_patofiziologija
26/05/2025	8:00	11:15	v12 Oral digestion	4E-1, 4E-2		3:15	Nastavnici na predmetu	V_fiziologija
26/05/2025	11:30	13:00	s08 Urine	4E-1, 4E-2, 4E-3		1:30	Aladrovic J., Pejakovic Hlede J.	P_farmakologija
28/05/2025	8:15	11:30	v13 Stomach and intestine digestion	4E-1, 4E-2		3:15	Nastavnici na predmetu	V_fiziologija
28/05/2025	14:30	16:00	p23 Intestinal digestion 1	4E-1, 4E-2, 4E-3		1:30	Paden L.	P_fiziologija
29/05/2025	10:00	13:15	v13 Stomach and intestine digestion	4E-3		3:15	Nastavnici na predmetu	V_patofiziologija
29/05/2025	13:30	14:15	p25 Liver	4E-1, 4E-2, 4E-3		0:45	Paden L.	P_fiziologija
29/05/2025	14:15	15:45	p24 Intestinal digestion 2	4E-1, 4E-2, 4E-3		1:30	Paden L.	P_fiziologija
02/06/2025	11:00	14:15	v14 Digestion in ruminants	4E-1, 4E-2		3:15	Nastavnici na predmetu	V_fiziologija
03/06/2025	8:15	9:45	p26 Neonatal physiology	4E-1, 4E-2, 4E-3		1:30	Aladrovic J.	P_fiziologija
03/06/2025	13:00	16:15	v14 Digestion in ruminants	4E-3		3:15	Nastavnici na predmetu	V_fiziologija
04/06/2025	10:00	11:30	p27 Thermoregulation and skin physiology	4E-1, 4E-2, 4E-3		1:30	Paden L.	P_fiziologija
04/06/2025	15:15	16:15	Physiology of Domestic Animals II		Colloquium 1	1:00	Shek Vugrovecki A.	P_fiziologija
05/06/2025	7:30	10:45	v15 Frequency and quality of rumen contractions	4E-3		3:15	Nastavnici na predmetu	V_fiziologija, V_štala

Activities - Physiology of Domestic Animals II (5/5)

Start Date	Start T	End Ti	Subject	Group	Note	Length	Instructor	Room
06/06/2025	9:45	13:00	v15 Frequency and quality of rumen contractions	4E-1, 4E-2		3:15	Nastavnici na predmetu	V_fiziologija, V_štala
09/06/2025	14:30	16:00	s10 Stomach digestion	4E-1, 4E-2, 4E-3		1:30	Paden L.	P_farmakologija
10/06/2025	10:30	12:00	s11 Forestomach digestion	4E-1, 4E-2, 4E-3		1:30	Aladrovic J.	P_fizika
11/06/2025	9:30	11:00	s12 Intenstine digestion	4E-1, 4E-2, 4E-3		1:30	Paden L., Pejakovic Hlede J.	P_fiziologija
11/06/2025	13:35	15:05	s13 Vitamins and minerals metabolism	4E-1, 4E-2, 4E-3		1:30	Pejakovic Hlede J.	P_fiziologija
16/06/2025	10:00	11:00	Physiology of Domestic Animals II		Colloqium 2	1:00	Shek Vugrovecki A.	P_fiziologija
Total: 70						148:45		

STUDENT OBLIGATIONS

Lecture attendance	During semester a student must attend 24 hours (50%) in order to gain minimal 3 points. The maximum number of points from this evaluation element is 6.
Seminars attendance	During the course the student must be present at 15 seminar hours to achieve a minimum of 4 points. The maximum score of this evaluation element is 6 points. If the student, upon the completion of the course, makes up for nonattendance (excused and approved) of the missed seminar, he gains points which are added to the previously gained points.
Practicals attendance	During semester a student must attend 40 practical hours in order to gain minimal 4 points. The maximum number of points from this evaluation element is 6. If the student, upon the completion of the course, makes up for nonattendance (excused and approved) of the missed exercise (excused and approved), points are added to the gained ones.
Active participation in seminars and practicals	During the 22 seminar hours and 60 hours of the practical classes, the student must complete the assigned. A student can earn up to 2 points per seminar, and a total of 4 points for producing and successfully presenting a seminar paper. For six positive answers (oral or written) the student earns an additional 6 points. During the course of seminars and exercises, the student must achieve at least 5 points and a maximum of 10 points
Final exam	The final exam starts with a student's short analysis of results gained from the first four evaluation elements. At the final exam the student answers the questions in oral form. The final exam comprises the material from lessons, and it estimates the capability of a student to connect physiological processes. The maximum gained number of points at the final exam is 40 points. Regardless of the gained number of points from the first four evaluation elements, the student must show minimal knowledge at the final exam in order to earn minimal 24 points. If the student did not satisfy the final part of the exam, he/she can retake the final exam in previously determined terms.
Examination requirements	Student requirements are defined in the Regulations on the Integrated Undergraduate and Graduate Study of Veterinary Medicine (2022). Given the above, the student must acquire a minimum number of points from all assessment elements in order to take the final exam. Regulations On Intergraduate And Graduate Studies, Article 41: a student can justifiably be absent from up to 50% of the lectures; 30% of the seminars and 30% of the exercises.

GRADING AND EVALUATING STUDENT WORK

Continuous knowledge-checking (mid-terms)	During the course of the Physiology of Domestic Animals II, two assessments of knowledge (colloquia) will be organized. The first colloquium includes the digestion and excretory physiology and the second cardiovascular and respiratory physiology. At each colloquium, the student must achieve at least 10 points to achieve the required 20 points. The maximum number of points scored from this grading element is 32 points. A student who does not achieve the necessary points during the course of instruction is entitled to three times access to a colloquium retake that will be organized in certain terms. The terms of the colloquium from the Physiology of Domestic Animals II in the academic year 2024/2025. Cardiovascular and respiratory systems physiology June 4th, 2025 at 15pm Digestive and excretory systems physiology June 16th, 2025 at 10am
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Course: Physiology of domestic animals II

	The terms of repeated colloquium from the Physiology of Domestic Animals II during the summer semester and the summer exam period of the academic year 2022/2023 will be held according to the following schedule: June 25th, 2025 at 10 am July 2nd, 2025 at 10 am September 10th, 2025 at 10 am
Final exams (dates)	25/4/2025; 27/6/2025; 4/7/2025; 14/7/2025; 2/9/2025; 18/9/2025
Form of final exam	oral exam

LITERATURE

Obligatory literature	1. SJAASTAD Ø. V., SAND O., HOVE K. (2010): Physiology of Domestic Animals. The 12th ed. Scandinavian veterinary press. 2. CUNNINGHAM, J. G. (2002): Textbook of veterinary physiology. 3rd edition, W. B. Saunders Company. 3. WILLIAM O. REECE (2004): Dukes' physiology of domestic animals, The 12th ed. Cornell University Press. Ithaca and London 4. VANDER, A. J., SHERMAN J. H., LUCIANO D. S (1990): Human physiology. The mechanisms of body function. The 5th ed. McGraw-Hill Publishing Comp. New York.
Optional literature	1. FELDMAN, B. F., ZINKL J. G., JAIN N. C. (2000): Schalm's Veterinary Hematology. 5th ed. Lippincott Williams & Wilkins. 2. KANEKO, J. J., HARVEY J. W., BRUSS M. L (1987): Clinical Biochemistry of Domestic Animals. Academic Press. San Diego, Boston, New York, Sydney, Tokyo. 3. PAYNE, J. M., PAYNE S. (1987): The Metabolic Profile Test. Oxford University Press. Oxford, New York, Tokyo. 4. SCHMIDT-NIELSEN, K. (1997): Animal Physiology. Adaptation and Environment. Cambridge University Press. 5. STURKIE, P.D. (2000): Avian Physiology. Springer Verlag, New York, Berlin, Heidelberg, Tokyo.

OBJECTIVES AND LEARNING OUTCOMES

Course objectives	Course Physiology of domestic animals II qualifies students for progressive development of knowledge and understanding of basic principles and facts of physiological processes from cell to the total body, understanding and correlating of regulatory mechanisms, understanding of homeostasis keeping, acid-base balance, development of knowledge and skills related to body liquids in special regard of blood physiology, understanding of physiological function of muscle/nervous system, physiological function of hormones in context of the whole homeostatic system. The goal is to provide the progressive development of skills in collecting, preparing, and interpreting the results of different samples analysis, to provide modern trends in veterinary physiology so that students will achieve a working knowledge of physiology; development of abilities for interpretation, and conclusion about information; abilities of searching for information in literature.
Learning outcomes	After successfully mastering the course students will be able to: 1. describe physiology of heart and cardiovascular system, respiration, digestion in monogastric animals and ruminants, excretion, the metabolism of nutrients, minerals and vitamins, physiological processes of oviposition, lactation and thermoregulation; 2. associate regulatory mechanisms of specific body systems;

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|--|---|
| | <ul style="list-style-type: none">3. interpret functions of different body systems during different physiological conditions;4. prepare biological samples for various laboratory analyses;5. know the concept of modern diagnostic tools and machines (haematological and biochemical analyser, spirometry, ECG, EMG, EEG);6. analyse and interpret the results of laboratory tests |
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GRADING SCHEME

<i>Points</i>	<i>Grade</i>
Up to 59	1 (F)
60-76	2 (D,E)
77-84	3 (C)
85-92	4 (B)
93-100	5 (A)

Course leader

Ana Shek Vugrovec
izv. prof. dr. sc. Ana Shek Vugrovečki

Head of organizational unit:

Iva Ana Shek Vugrovec
izv. prof. dr. sc. Ivona Žura Zaja

Note: The course leader is required to submit a Course Syllabus to all teachers and associates pertaining to the Cours