

UNIVERSITY OF ZAGREB
FACULTY OF VETERINARY MEDICINE
Heinzlova 55
Tel. 01/2390174
Division: Basic and preclinical science division
Organizational unit: Physiology and Radiobiology
E-mail of the course leader: ana.shek@vef.unizg.hr
Register No of the organisational unit:
Zagreb, 09/02/2023



159978	REPUBLIKA HRVATSKA	
Veterinarski fakultet u Zagrebu		
Primljeno:	14.02.2023	
Klasifikacijska oznaka	Org. jed.	
605-03/22-04/35	251-61-32;	
Uredbeni broj	Prilozi	Vrijednost
251-61-06/406-23-74	0	-

COURSE SYLLABUS

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

Academic year 2022/2023

Course leader: Assist. Prof., Ana Shek Vugrovečki, DVM, PhD
Deputy course leader: Assist. Prof., Ivona Žura Žaja DVM, PhD

Teachers: Jasna Aladrović, DVM, PhD, Full Prof., Lana Pađen DVM, PhD, Assist. Prof., Ana Shek Vugrovečki, DVM, PhD, Assist. Prof., Ivona Žura Žaja DVM, PhD, Assist. Prof., Josip Miljković, DVM, teaching assistant

First day of classes: 27/02/2023

Last day of classes: 13/06/2023

Timetable for LECTURES academic year 2022/2023

21				
Date	Methodological unit	Teacher	Location / Time	Literature
27/02/2023 1 st lecture	Digestion in the mouth Functions of digestion Characteristics of the digestion in animals with simple stomach and ruminants Hunger and thirst Food intake Digestion in the mouth: mastication and salivation Salivary secretion Swallowing process	assistant professor Ana Shek Vugrovečki, DVM, PhD,	Lecture room Physiology 10am-12pm	(see the list of the required literature)
28/02/2023 2 nd lecture	Digestion and simple stomach Functions of the stomach mucosa Composition and function of the gastric juice Regulation of the gastric juice secretion Regulation of the gastric juice secretion Vomiting	assistant professor Ana Shek Vugrovečki, DVM, PhD,	Lecture room Physiology 10am-12pm	(see the list of the required literature)
01/03/2023 3 rd lecture	Rumen digestion 1. Basic principle of ruminant-micro population symbiosis Rumen motility Water-dry substances ratio Functions of the oesophageal groove Gases in the rumen	assistant professor Ana Shek Vugrovečki, DVM, PhD,	Lecture room Physiology 10am-12am	(see the list of the required literature)

11/4/2023 14 th lecture	Vitamins metabolism Vitamins metabolism Vitamins resorption Vitamins deposition Water soluble and fat-soluble vitamins specificities	assistant professor Ivona Žura Žaja DVM, PhD	Lecture Room Physiology 2pm-4pm	(see the list of the required literature)
13/4/2023 15 th lecture	Minerals metabolism Role of minerals in synthesis and tissues metabolism Microelement metabolism - Na, K, Ca, P, Mg, S Microelement metabolism Fe, Cu, Zn, Mo, Co, Se, I	assistant professor Ana Shek Vugrovečki, DVM, PhD	Lecture Room Physiology 2pm-4pm	(see the list of the required literature)
21/4/2023 16 th lecture	Cardiovascular system Physiological characteristics of the cardiovascular system in domestic animals Physiological characteristics of the heart muscle The conduction system	assistant professor Ivona Žura Žaja DVM, PhD	Lecture Room Physiology 2pm-4pm	(see the list of the required literature)
25/4/2023 17 th lecture	Cardiovascular system The Phases of the Cardiac Cycle Electrical and mechanical changes in the heart Correlation of the heart excitation and contraction Changes of pressure and volume Sound changes Flow through heart	assistant professor Ivona Žura Žaja DVM, PhD	Lecture Room Physiology 12pm-2pm	(see the list of the required literature)
27/4/2023 18 th lecture	Cardiovascular system Stroke Volume	assistant professor Ivona Žura Žaja DVM, PhD	Lecture Room Physiology 8am-9:45am	(see the list of the required literature)

	Cardiac output Regulation of the heart rate: a) autoregulation b) humoral regulation c) endocrine and nerve regulation			
04/05/2023 19 th lecture	Cardiovascular system Circulation Arterial blood pressure Venous blood pressure Regulation of blood pressure Peripheral circulation: a) Arterial circulation b) Capillary circulation c) Venous circulation Regulation of peripheral circulation	assistant professor Ivona Žura Žaja DVM, PhD	Lecture Room Physics 10am-11am	(see the list of the required literature)
04/05/2023 20 th lecture	Respiratory system Functions of respiratory system Ventilation mechanic Ventilation types Ventilation frequency	assistant professor Ana Shek Vugrovečki, DVM, PhD	Lecture Room Physics 11am-12pm	(see the list of the required literature)
08/05/2023 21 st lecture	Respiratory system Gases exchange in lungs Gases transport in the blood	assistant professor Ana Shek Vugrovečki, DVM, PhD	Lecture Room Physiology 10am-12pm	(see the list of the required literature)
10/5/2023 22 nd lecture	Respiratory system Tissue gases exchange Regulation of breathing	assistant professor Ana Shek Vugrovečki, DVM, PhD	Lecture Room Physiology 10am-11am	(see the list of the required literature)
10/5/2023 23 rd lecture	Mammary gland Mammary gland functions and development Mammary gland blood supply and lymph drainage	assistant professor Lana Pađen DVM, PhD	Lecture Room Physiology 11am-12pm	(see the list of the required literature)

Course Physiology of domestic animals II

	metabolism				
19/04/2023 7th seminar	Mineral metabolism Microelements as a coenzyme factor Minerals in cell metabolism	Ana Šek Vugrovečki, DVM, PhD, assistant professor	1,2,3	Lecture Room Pharmacology 1pm-2pm	(see the list of the required literature)
26/04/2023 8th seminar	Neonatal physiology Blood cells Heart and blood vessels, Respiratory system thermoregulation	Jasna Aladrović, DVM, PhD, associate professor	1,2,3	Lecture Room Physiology 2pm-4pm	(see the list of the required literature)
10/05/2023 9th seminar	Bioenergetics Bioenergetics basic principles Energy turnover Feed gross energy Digestible energy Metabolic energy Basal metabolic energy ATP synthesis in metabolism Production systems efficiency Bio-calorimetry Respiratory Quotient and its interpretation	Lana Pađen DVM, PhD, assistant professor	1,2,3	Lecture Room Physiology 2pm-4pm	(see the list of the required literature)
16/05/2023 10th seminar	Cardiovascular system Cardiovascular	Ivona Žura Žaja DVM, PhD, assistant professor	1,2,3	Lecture Room Pharmacology 10am-12pm	(see the list of the required literature)

Faculty of Veterinary Medicine Zagreb

Course Physiology of domestic animals II

	receptors Cardiac muscle metabolism and cardiac work Heart failure Hemodynamic Lymph system				
19/05/2023 11th seminar	Circulatory system Coronary circulation Pulmonary circulation Hepatic circulation Circulatory shock – physiological causes	Ivona Žura Žaja DVM, PhD, assistant professor	1,2,3	Lecture room Physiology 10am-12pm	(see the list of the required literature)
24/05/2023 12th seminar	Respiratory system Coughing, sneezing Pulmonary ventilation Lung volumes Lung capacities Respiration in fish Respiration in birds	Ana Šek Vugrovečki, DVM, PhD, assistant professor	1,2,3	Lecture room Pharmacology 2pm-4pm	(see the list of the required literature)
05/06/2023 13th seminar	The physiology of aging, oxidants and the antioxidant system factors affecting aging Influence of hormones and free	Ivona Žura Žaja DVM, PhD, assistant professor	1,2,3	Lecture room Pharmacology 12pm-2pm	(see the list of the required literature)

Faculty of Veterinary Medicine Zagreb

09/03/2023 2 nd practicals	quality of rumen contractions Observation of rumination, auscultation of content-mixing and contractions for the removal of gases from the pre-stomach. Taking food by ruminants, observing defecation and urination in ruminants.				stables Clinics for Obstetrics and Reproduction 10am-2pm	
10/03/2023 2 nd practicals	Frequency and quality of rumen contractions Observation of rumination, auscultation of content-mixing and contractions for the removal of gases from the pre-stomach. Taking food by ruminants, observing defecation and urination in ruminants.	Teachers and associates	Construction exercise	3	Practical Hall, Department of Physiology and Radiobiology + stables Clinics for Obstetrics and Reproduction 12pm-4pm	(see the list of the required literature)
20/03/2023 3 rd practicals	Digestion in ruminants Evidence of nitrite degradation Proof of urea Proof of lactic acid	Teachers and associates	Laboratory exercise	3	Practical Hall, Department of Physiology and Radiobiology 2pm-6pm	(see the list of the required literature)

	Digestion of milk The formation of gas in the rumen Observation of microorganisms in rumen content					
22/03/2023 3 rd practicals	Digestion in ruminants Evidence of nitrite degradation Proof of urea Proof of lactic acid Digestion of milk The formation of gas in the rumen Observation of microorganisms in rumen content	Teachers and associates	Laboratory exercise	1,2	Practical Hall, Department of Physiology and Radiobiology 12pm-4pm	(see the list of the required literature)
27/03/2023 4 th practicals	Stomach and intestine digestion Gastric juice: effect of pepsin, influence of external factors on pepsin, titration of gastric juice Pancreatic juice: action of pancreatic lipase Bile: evidence of bile salts and bile colours	Teachers and associates	Laboratory exercise	1,2	Practical Hall, Department of Physiology and Radiobiology 8am-12pm	(see the list of the required literature)
30/03/2023 4 th practicals	Stomach and intestine digestion Gastric juice: effect of pepsin, influence of external factors on pepsin, titration	Teachers and associates	Laboratory exercise	3	Practical Hall, Department of Physiology and Radiobiology 8am-12pm	(see the list of the required literature)

	Serum glucose determination Total protein and albumin determination Serum protein electrophoresis					
03/05/2023 9 th practicals	Reproduction physiology Gonad activity hormonal regulation puberty, reproduction physiology in male and female, gravidity	Teachers and associates	Laboratory exercise	1,2	Practical Hall, Department of Physiology and Radiobiology 12pm-4am	(see the list of the required literature)
05/05/2023 9 th practicals	Reproduction physiology Gonad activity hormonal regulation puberty, reproduction physiology in male and female, gravidity	Teachers and associates	Laboratory exercise	3	Practical Hall, Department of Physiology and Radiobiology 12pm-3:30pm	(see the list of the required literature)
08/05/2023 10 th practicals	Physiology of the cardiovascular system Cardiac automatism and rhythmicity. Compare the length of the period of relative refractory period of the heart muscle and skeletal muscle - it is not possible to tetanize	Teachers and associates	Construction exercise – computer simulations	1,2,3	Department of Physiology and Radiobiology + Department of Pathophysiology, computer hall 12pm-4pm	(see the list of the required literature)

	the heart muscle. Extrasystole Blood flow, cardiac cycle, end diastolic volume, end systolic volume, stroke volume, and minute volume. The effect of blood pressure on blood flow. Peripheral resistance and factors affecting peripheral resistance. Differences between individual tissues with respect to blood requirements.					
09/05/2023 11 th practicals	ECG Depolarization and repolarization Three standard ECG leads Interpretation of electrocardiograms The Einthoven Triangle Bipolar ECG recording	Teachers and associates	Laboratory exercise	1,2	Practical Hall, Department of Physiology and Radiobiology 10am-2pm	(see the list of the required literature)
09/05/2023 11 th practicals	ECG Depolarization and repolarization Three standard ECG leads Interpretation of electrocardiograms The Einthoven	Teachers and associates	Laboratory exercise	3	Practical Hall, Department of Physiology and Radiobiology 2pm-6pm	(see the list of the required literature)

06/06/2023 14 th practicals	Exercise physiology Energy metabolism during exercise Hormonal regulation during exercise Neuromuscular system during exercise Astrand's test Blood lactate concentration determination Anaerobic threshold	Teachers and associates	Laboratory exercise	1,2	Practical Hall, Department of Physiology and Radiobiology 12pm-4pm	(see the list of the required literature)
07/06/2023 14 th practicals	Exercise physiology Energy metabolism during exercise Hormonal regulation during exercise Neuromuscular system during exercise Astrand's test Blood lactate concentration determination Anaerobic threshold	Teachers and associates	Laboratory exercise	3	Practical Hall, Department of Physiology and Radiobiology 8am-12pm	(see the list of the required literature)

STUDENT OBLIGATIONS

Lecture attendance	During semester a student must attend 23 lecture lessons 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 20 seminar lessons to achieve a minimum of 4,8 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 48 hours of practical in order to gain minimal 4,8 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 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 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. Article 41: a student can justifiably be absent from up to 50 % of the lectures; 20% of the seminars and 20 % of the exercises.

GRADING AND EVALUATING STUDENT WORK

Continuous knowledge-checking (mid-terms)	<p>During the course of the Physiology of Domestic Animals II, two assessment 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.</p> <p>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.</p> <p>The terms of the colloquium from the Physiology of Domestic Animals II in the academic year 2022/2023</p> <p>Digestive and excretory systems physiology (May 4th, 2023) at 9am Cardiovascular and respiratory systems physiology (June 5th, 2023) at 11h</p> <p>The terms of repeated colloquium from the Physiology of Domestic Animals II during the summer semester and the summer</p>
---	---

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 Štade Ugrovec

Head of organizational unit:

J. Vilić

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