

Course: Pathophysiology II

UNIVERSITY OF ZAGREB
FACULTY OF VETERINARY MEDICINE
Heinzlova 55
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Division: Basic and Pre-clinical Sciences Division
Organizational unit: Pathophysiology
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Register No of the organisational unit:
Zagreb, 21/02/2026

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Veterinarski fakultet u Zagrebu			
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602-04/25-22/34	251-61-41;		
Uredžbeni broj	Prilozi	Vrijednost	
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COURSE SYLLABUS

Course name: Pathophysiology II
Academic year 2025/2026

Course leader: Full Prof. Maja Belić

Deputy course leader: Full Prof. Romana Turk

Teachers: Full Prof. Maja Belić; Full Prof. Mirna Robić; Full Prof. Romana Turk; teaching assistant Siniša Faraguna, DVM

Associate: Sandra Kunštek, M.Sc. Biotech.

First day of classes: 12/03/2026

Last day of classes: 12/06/2026

Activities - Pathophysiology II (1/4)								
Start Date	Start T	End Ti	Course	Group	Note	Length	Instructor	Room
12/03/2026	10:00	11:30	p01 Metabolic disturbances I	6E-1, 6E-2, 6E-3		1:30	Robić M.	V_patofiziologija
16/03/2026	10:00	11:30	p02 Metabolic disturbances II	6E-1, 6E-2, 6E-3		1:30	Robić M.	V_patofiziologija
17/03/2026	11:30	13:00	v01 Disturbances in lipid metabolism	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
19/03/2026	11:00	12:30	v02 Clinical enzymology	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
20/03/2026	9:30	11:00	v03 Disturbances in bilirubin metabolism	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
24/03/2026	9:00	9:45	p03 Metabolic disturbances III	6E-1, 6E-2, 6E-3		0:45	Robić M.	V_patofiziologija
24/03/2026	9:45	10:30	p04 Liver and biliary system I	6E-1, 6E-2, 6E-3		0:45	Turk R.	V_patofiziologija
25/03/2026	11:45	13:15	p05 Liver and biliary system II	6E-1, 6E-2, 6E-3		1:30	Turk R.	V_patofiziologija
26/03/2026	11:45	13:15	v04 Laboratory diagnostics CSF	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
26/03/2026	13:30	15:00	p06 Liver and biliary system III	6E-1, 6E-2, 6E-3		1:30	Turk R.	P_fiziologija
30/03/2026	8:30	10:00	v05 Laboratory diagnostics urine	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
31/03/2026	11:45	13:15	v06 Colloquium I, Hematopoietic system	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
01/04/2026	8:00	9:30	v07 RBC count	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
01/04/2026	9:45	11:15	p07 Disturbances in forestomachs I	6E-1, 6E-2, 6E-3		1:30	Belić M.	P_fiziologija
07/04/2026	14:00	15:30	p08 Disturbances in forestomachs II	6E-1, 6E-2, 6E-3		1:30	Belić M.	V_patofiziologija

Activities - Pathophysiology II (2/4)								
Start Date	Start T	End Ti	Course	Group	Note	Length	Instructor	Room
08/04/2026	10:00	11:30	p09 Disturbances in stomach digestion	6E-1, 6E-2, 6E-3		1:30	Belić M.	V_patofiziologija
09/04/2026	11:30	13:00	p10 Disturbances in motoric function	6E-1, 6E-2, 6E-3		1:30	Belić M.	V_patofiziologija
10/04/2026	8:00	9:30	p11 Disturbances in intestinal digestion	6E-1, 6E-2, 6E-3		1:30	Belić M.	V_patofiziologija
15/04/2026	15:00	16:30	v09 Determination of ESR, HB and PCV	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
20/04/2026	12:00	13:30	p12 Hematopoietic system I	6E-1, 6E-2, 6E-3		1:30	Belić M.	P_fiziologija
22/04/2026	11:30	13:00	p13 Hematopoietic system II	6E-1, 6E-2, 6E-3		1:30	Belić M.	V_patofiziologija
22/04/2026	13:00	14:30	v08 Reticulocyte count	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
22/04/2026	14:30	16:00	p15 Pulmonali diseases I	6E-1, 6E-2, 6E-3		1:30	Robić M.	P_fiziologija
23/04/2026	10:00	11:30	v10 Leukopoiesis	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
24/04/2026	9:45	11:15	p16 Pulmonali diseases II, shock	6E-1, 6E-2, 6E-3		1:30	Robić M.	V_patofiziologija
24/04/2026	11:30	13:00	v11 WBC count	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
29/04/2026	9:00	10:30	p17 Kidney diseases I	6E-1, 6E-2, 6E-3		1:30	Turk R.	V_patofiziologija
04/05/2026	11:30	13:00	v12 Determination of eosinophils count	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
04/05/2026	13:30	15:00	v13 Blood film preparation	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
05/05/2026	9:15	10:45	p18 Kidney diseases II	6E-1, 6E-2, 6E-3		1:30	Turk R.	V_patofiziologija

Activities - Pathophysiology II (3/4)								
Start Date	Start T	End Ti	Course	Group	Note	Length	Instructor	Room
08/05/2026	12:00	13:30	v14 Qualitative and quantitative changes in DLC	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
14/05/2026	8:15	9:45	v15 Morphologic changes of RBC	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
18/05/2026	8:15	9:45	p19 Heart diseases I	6E-1, 6E-2, 6E-3		1:30	Robić M.	V_patofiziologija
19/05/2026	10:00	11:30	v16 Leukogram interpretation	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
21/05/2026	10:00	11:30	v17 Blood film morphology changes	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
26/05/2026	10:00	11:30	v18 Bone marrow smear	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
27/05/2026	10:00	11:30	v19 Leukemias and lymphomas	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
28/05/2026	10:00	12:15	p20 Heart diseases II	6E-1, 6E-2, 6E-3		2:15	Turk R.	V_patofiziologija
29/05/2026	10:00	11:30	v20 Haematology of birds	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
01/06/2026	10:00	11:30	v21 Haematology of reptiles	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
02/06/2026	10:00	11:30	v22 Practical colloquium II	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
02/06/2026	11:45	13:15	p21 Disorders of hemostasis	6E-1, 6E-2, 6E-3		1:30	Turk R.	P_fiziologija
03/06/2026	10:00	11:30	v23 Hemostasis	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
08/06/2026	10:00	11:30	v24 Laboratory diagnostics of kidneys	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija

Activities - Pathophysiology II (4/4)

Start Date	Start T	End Ti	Course	Group	Note	Length	Instructor	Room
09/06/2026	10:00	11:30	v25 Colloquium III, Interpretation of laboratory findings	6E-1, 6E-2, 6E-3		1:30	Nastavnici na predmetu	R_patofiziologija, V_patofiziologija
10/06/2026	12:00	13:30	s01 Individual presentation I	6E-1, 6E-2, 6E-3		1:30	Robić M.	V_patofiziologija
11/06/2026	12:00	13:30	s02 Individual presentation II	6E-1, 6E-2, 6E-3		1:30	Belić M.	V_patofiziologija
12/06/2026	12:00	13:30	s03 Individual presentation III	6E-1, 6E-2, 6E-3		1:30	Turk R.	V_patofiziologija
Total: 48						71:15		

STUDENT OBLIGATIONS

Lecture attendance	Maximum points – 6 Minimum points – 3 (one hour of lecture equals 0.15 points) During the course Pathophysiology II, a student must attend at least 20 hours of lectures to earn the minimum of three points. For each excused absence, the student is credited 0.15 points per hour.
Seminars attendance	Maximum points – 6 Minimum points – 4 (one hour of seminar equals 1.0 point) A student must attend at least four out of the six possible seminar hours to earn the minimum of four points. Any excused absence within the allowed limit (2 hours) can be compensated in agreement with the seminar leader through a written assignment, in which case the student is credited 1 point per hour.
Practicals attendance	Maximum points – 6 Minimum points – 4.2 (one hour of practicals equals 0.12 points) A student must attend at least 35 hours of practicals. Any excused absence within the allowed limit (15 hours) can be made up in agreement with the practical leader through an oral examination on the missed practical content. For each successfully compensated practical session, the student is credited 0.12 points per hour.
Active participation in seminars and practicals	Maximum points – 10 Minimum points – 5 Each properly written, signed, and completed practical earns 0.2 points, amounting to a maximum of 5 points (25 sessions × 0.2 = 5). Throughout the practicals, short oral knowledge assessments will be conducted regularly. A maximum of 2.5 points can be earned this way (each oral assessment is worth 0.83 points). During the seminar , a student can independently prepare and deliver one oral presentation in the form of a PowerPoint presentation. The presentation of the assigned material can earn up to 2.5 points, depending on the student's preparation and presentation quality.
Final exam	Maximum points– 40 Minimum points – 24 To be eligible for the final exam, the student must earn a minimum of 16.2 points from all assessment components (attendance at lectures, practicals, and seminars, as well as participation in practicals and seminars) and at least 20 points from continuous knowledge assessments (colloquia).

	<p>The final exam begins with a brief analysis of the student's results from all mentioned assessment components. During the final exam, the student answers questions orally. The questions cover all areas of the curriculum that the student has attended in lectures and seminars.</p> <p>Regardless of the points earned in the five components, the student must demonstrate a minimum level of knowledge in the final exam to achieve at least 24 points. If the student does not meet the required standard in the final exam, they may retake the exam on specified dates.</p> <p>The final grade is determined based on the total sum of points from all assessment components.</p>
Examination requirements	<p>Student requirements are defined in the Regulations on the Integrated Undergraduate and Graduate Study of Veterinary Medicine (2024). 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.</p>

GRADING AND EVALUATING STUDENT WORK

Continuous knowledge-checking (mid-terms)	<p>Maximum points – 32 Minimum points – 20</p> <p>There are 2 written and 1 practical colloquium that will be performed in regular practical's terms:</p> <ol style="list-style-type: none"> 1. First colloquium (biochemistry) consists of 6 questions covering biochemical topics from practicals (p01–p05). Minimum: 7 points; maximum: 12 points. Colloquium date: March 31, 2026. 2. Second colloquium (blood cell morphology) is conducted on computers via the Merlin system. The colloquium consists of 40 different images. To pass, the student must correctly identify at least 30 images. Minimum: 3 points; maximum: 4 points. Colloquium date: June 02, 2026. 3. Third colloquium (hematology) consists of 16 questions covering hematology topics from practicals (p06–p25). Minimum: 10 points; maximum: 16 points. Colloquium date: June 09, 2026. <p>For students who do not achieve minimal number of points from each colloquium, three additional terms will be organized during the academic year. Students who do not pass colloquia in current academic year will lose the possibility to attend the exam and must re-enroll the course to gain sufficient knowledge and possibility to attend the colloquia in the following academic year.</p> <p>Dates of colloquia: 31/03/26, 02/06/26, 09/06/26</p>
Final exams (dates)	24/06/26, 10/07/26, 08/09/26, 18/09/26
Form of final exam	Oral

LITERATURE

Obligatory literature	<ol style="list-style-type: none">1. DUNLOP, R. H., C.-H. MALBERT (2004): Veterinary Pathophysiology, Blackwell Publishing, Ames, Iowa.2. FELDMAN, B. F., J. G. ZINKL, N. C. JAIN (2000): Schalm's Veterinary Hematology. Lippincott Williams and Wilkins, Philadelphia, Baltimore, New York, London, Buenos, Aires, Hong Kong, Sydney, Tokyo.SLAUSON, D. O., B. J. COOPER (2002): Mechanism of Disease. Mosby, St. Louis, London, Philadelphia, Sydney, Toronto.3. HANSEN, M. (1998): Pathophysiology. Foundations of disease and Clinical Intervention. Saunders company, USA.4. REAGAN, W. J., T. G. SANDERS, D. B. DENICOLA (1998): Veterinary Hematology: Atlas of Common Domestic Species, Iowa State University Press.5. E-learning materials
Optional literature	

OBJECTIVES AND LEARNING OUTCOMES

Course objectives	The course objective is gaining knowledge on mechanisms involved in development of pathophysiological processes in individual organs and organ systems on molecular and cellular level and tissue and organs levels which provides understanding the course of disease and basis for understanding clinical courses. Overall consideration of pathophysiological mechanisms enables students to develop sense for integrative approach to pathological process at the whole organism level. In addition, the objective of the course is to develop skills in laboratory diagnostic of pathological processes and interpretation of changes in laboratory findings that could help in diagnosis of diseases.
Learning outcomes	After successful mastering, student will be able to: <ul style="list-style-type: none">• Describe disorders of carbohydrate, fat, and protein metabolism.• Describe the pathophysiological mechanisms of liver and biliary system dysfunction.• Describe the pathophysiology of digestion.• Describe the pathophysiological mechanisms of heart and blood vessel dysfunction.• Describe the pathophysiological mechanisms of blood and hematopoietic organ disorders.• Explain the pathophysiological mechanisms of respiratory system dysfunction.• Explain the pathophysiological mechanisms of kidney diseases.• Perform biochemical and hematological analyses of blood, serum, urine, and cerebrospinal fluid.• Interpret laboratory test results.

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

B. Belic

Head of organizational unit:

Robić

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