

## Pathophysiology I

UNIVERSITY OF ZAGREB  
FACULTY OF VETERINARY MEDICINE

Heinzelova 55

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Division: Basic and pre-clinical sciences division

Organizational unit: Pathophysiology

E-mail of the course leader: mrobic@vef.hr

Register No of the organisational unit:

Zagreb, 10/9/2024

|                                                                                     |                      |            |
|-------------------------------------------------------------------------------------|----------------------|------------|
|  |                      |            |
| 207309                                                                              | REPUBLIKA HRVATSKA   |            |
| Veterinarski fakultet u Zagrebu                                                     |                      |            |
| Primljeno:                                                                          | 11.09.2025           |            |
| Klasifikacijska oznaka                                                              | Org. jed.            |            |
| 602-04/25-22/34                                                                     | 251-61-41/251-61-32; |            |
| Uredžbeni broj                                                                      | Prilozi              | Vrijednost |
| 251-61-13-25-75                                                                     | 0                    | -          |

### COURSE SYLLABUS

Course name: Pathophysiology I  
Academic year 2025/2026

Course leader: Full Prof. Mirna Robić

Deputy course leader: (title, name and surname): Full Prof. Maja Belić

Teachers: Full Prof. Maja Belić, Full Prof. Mirna Robić, Full Prof. Romana Turk, teaching assistant Siniša Faraguna, lecturer Sanja Kunštek

First day of classes: 4/11/2025

Last day of classes: 15/12/2025

### Activities - Pathophysiology I (1/2)

| Start Date | Start T | End Ti | Subject                                            | Group            | Note | Length | Instructor             | Room              |
|------------|---------|--------|----------------------------------------------------|------------------|------|--------|------------------------|-------------------|
| 04/11/2025 | 11:30   | 13:00  | p01 Introduction, inflammation and reparation      | 5E-1, 5E-2, 5E-3 |      | 1:30   | Turk R.                | P_fiziologija     |
| 06/11/2025 | 12:00   | 13:30  | p02 Disturbances in acid-base balance              | 5E-1, 5E-2, 5E-3 |      | 1:30   | Turk R.                | P_fiziologija     |
| 13/11/2025 | 11:45   | 13:15  | p03 Disorders of pituitary and thyroid gland       | 5E-1, 5E-2, 5E-3 |      | 1:30   | Robić M.               | P_fiziologija     |
| 19/11/2025 | 10:00   | 11:30  | p04 Disorders of pancreas and adrenal glands       | 5E-1, 5E-2, 5E-3 |      | 1:30   | Robić M.               | P_fiziologija     |
| 19/11/2025 | 11:50   | 12:35  | v01 Spectrophotometry and laboratory interferences | 5E-1, 5E-2, 5E-3 |      | 0:45   | Nastavnici na predmetu | V_patofiziologija |
| 21/11/2025 | 12:00   | 13:30  | v02 Total protein concentration in serum           | 5E-1, 5E-2, 5E-3 |      | 1:30   | Nastavnici na predmetu | V_patofiziologija |
| 28/11/2025 | 12:00   | 13:30  | v03 Dysproteinemia and acute phase proteins        | 5E-1, 5E-2, 5E-3 |      | 1:30   | Nastavnici na predmetu | V_patofiziologija |
| 04/12/2025 | 10:00   | 11:30  | p05 Tumorigenesis                                  | 5E-1, 5E-2, 5E-3 |      | 1:30   | Belić M.               | V_patofiziologija |
| 09/12/2025 | 10:30   | 12:00  | s01 Disorders of vitamins and mineral metabolism   | 5E-1, 5E-2, 5E-3 |      | 1:30   | Belić M.               | P_fiziologija     |
| 10/12/2025 | 10:45   | 12:15  | p06 Pathophysiology of nervous system              | 5E-1, 5E-2, 5E-3 |      | 1:30   | Belić M.               | P_fiziologija     |
| 10/12/2025 | 12:30   | 14:00  | v04 Disturbance in glucose metabolism              | 5E-1, 5E-2, 5E-3 |      | 1:30   | Nastavnici na predmetu | V_patofiziologija |
| 11/12/2025 | 9:45    | 11:15  | v05 Acid-base balance, cases                       | 5E-1, 5E-2, 5E-3 |      | 1:30   | Nastavnici na predmetu | V_patofiziologija |
| 12/12/2025 | 10:00   | 11:30  | s02 Oxidative stress and antioxidative protection  | 5E-1, 5E-2, 5E-3 |      | 1:30   | Turk R.                | P_fiziologija     |

| Activities - Pathophysiology I (2/2) |         |        |                   |       |          |        |            |                                         |
|--------------------------------------|---------|--------|-------------------|-------|----------|--------|------------|-----------------------------------------|
| Start Date                           | Start T | End Ti | Subject           | Group | Note     | Length | Instructor | Room                                    |
| 15/12/2025                           | 10:45   | 11:45  | Pathophysiology I |       | Kolokvij | 1:00   | Robić M.   | R_patofiziologija,<br>V_patofiziologija |
| Total: 14                            |         |        |                   |       |          | 19:45  |            |                                         |

| Start Date | Start T | End Ti | Subject           | Group | Note     | Length | Instructor | Room                                    |
|------------|---------|--------|-------------------|-------|----------|--------|------------|-----------------------------------------|
| 15/12/2025 | 10:45   | 11:45  | Pathophysiology I |       | Kolokvij | 1:00   | Robić M.   | R_patofiziologija,<br>V_patofiziologija |
| Total: 14  |         |        |                   |       |          | 19:45  |            |                                         |

## Timetable for LECTURES academic year 2025/2026

### STUDENT OBLIGATIONS

|                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lecture attendance                              | <p>Maximal number of points: 6<br/>         Minimal number of points: 3<br/>         (one hour of lectures is 0.5 points)<br/>         During the course of Pathophysiology I, student must attend minimum of six hours of lectures to achieve minimal 3 points.<br/>         Maximal number of points is achieved if student attends all of 12 hours of lectures. For each excused absence student gains back 0,5 points per hour of lecture</p>                                                                                                                                                                                                                                                                                                                                                                             |
| Seminars attendance                             | <p>Maximal number of points: 6<br/>         Minimal numbers of points: 4.5<br/>         (each seminar hour is 1.5 points)<br/>         Student must attend minimum three hours of seminars. Each excused absence in approved limits (three hours) students can make up in agreement with seminar leader in written form and the points for attendance will be given back</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Practicals attendance                           | <p>Maximal number of points: 6<br/>         Minimal numbers of points: 4,5<br/>         (each hour of practice is 0.67 points)<br/>         Student must be present at minimum of seven hours of practicals to achieve minimal 4,5 points.<br/>         Each excused absence within approved limits (three hours) students can make up in agreement with practical's leader. After successful made up student achieves 0.67 points for hour</p>                                                                                                                                                                                                                                                                                                                                                                               |
| Active participation in seminars and practicals | <p>Maximal number of points: 10<br/>         Minimal number of points: 5<br/>         Each attended, written and signed practical results in 1 point, therefore maximum of 5 points (5 programs x 1 = 5) can be achieved. During the practicals short knowledge checkings will be performed and that way students can gain maximum of 2 points. During the practicals colloquium containing 16 questions, each valued 2 points will be performed. For students not successfully passed, three additional colloquiums will be available. For students who fail to pass during those additional terms, the colloquium, required for final exam will be available in the next academic year.<br/>         During the seminars students elaborate given themes in smaller groups, and that way they can earn maximal 3 points</p> |
| Final exam                                      | <p>For final exam attendance student must gain minimal 17 points from attendance and active participation on lectures and practicals and minimum of 20 points from continuous knowledge checking. Exam will be in written and oral form. Students must achieve minimum of 14 points (out of maximal 23) in written exam to be able to attend the oral exam. On oral exam students have to answer six questions, achieving 6-18 points. The final mark is formed by adding all achieved points.</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. <b>Regulations On Intergraduate And Graduate Studies, Article 41:</b> 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

## Pathophysiology I

|                                           |                            |
|-------------------------------------------|----------------------------|
| Continuous knowledge-checking (mid-terms) | 15/12/2025                 |
| Final exams (dates)                       | 6/11/2025, 3/2/26, 13/2/26 |
| Form of final exam                        | Written and oral.          |

### LITERATURE

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Obligatory literature | <p>Gamulin, S., M. Marušić, Z. Kovač et al. (2013): Pathophysiology. Basic mechanisms of disease, Medicinska naklada, Zagreb</p> <p>David O. Slauson, Barry J. Cooper (1982., 1999.): Mechanisms of Disease. Mosby.</p> <p>Steven L. Stockham and Michael A. Scott (2008.): Fundamentals of Veterinary Clinical Pathology. Blackwell Publishing.</p> <p>Mary Anna Thrall (2004.): Veterinary Hematology and Clinical Chemistry. Lippincott Williams &amp; Wilkins.</p> <p>J. Kaneko (1980., 2008.): Clinical Biochemistry of Domestic Animals Fill according to the information from the Information package - the course catalog for the current academic year.</p> |
| Optional literature   | <p>Stjepan Gamulin Matko Marušić, Zdenko Kovač i sur. (1988., 2002., 2011.): Patofiziologija. Medicinska naklada, Zagreb.</p> <p>Tatjana Božić (2007., 2012.): Patološka fiziologija domaćih životinja. Naučna KMD, Beograd.</p> <p>Romana Turk (2005.): Vježbe iz patofiziologije - biokemijski dio (interna skripta).</p> <p>Nina Poljičak Milas: Patofiziologija poremećaja žlijezdi s unutarnjim lučenjem, web predavanje</p> <p>Mirna Robić (2016): Patofiziologija upale, bolesti deficit i suficita vitamin, web predavanje</p>                                                                                                                               |

**OBJECTIVES AND LEARNING OUTCOMES**

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Course objectives</b> | During the course of Pathophysiology I students achieve knowledge on basic pathophysiological processes on cellular and tissue level during homeostatic disturbances in organism. Therefore, the basis for better understanding disturbances in particular organs and organic system is achieved for understanding the course of Pathophysiology II. During practical part of the course students gain skills in performing basic biochemical laboratory analyses, choosing the correct method and proper interpretation of achieved results. |
| <b>Learning outcomes</b> | Cognitive outcomes: describe bioactive substances and their role in pathophysiological processes, understand endocrinopathies, describe disturbances in neural system function, Affective outcomes; define the terms of health and disease, psychomotoric outcomes: become able to handle biological samples and perform Biuret method.                                                                                                                                                                                                       |

**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



Head of organizational unit:



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