

<b>Program of Study</b>	<b>: GENERAL MEDICINE</b>
<b>Course</b>	<b>: PATHOLOGICAL PHYSIOLOGY</b>
<b>Abbreviation</b>	<b>: PFY/VAA11</b>
<b>Schedule</b>	<b>: 30 hours of lectures</b> <b>45 hours of exercises</b>
<b>Course Distribution</b>	<b>: 3<sup>rd</sup> year, 5<sup>th</sup> semester</b>
<b>Number of Credits</b>	<b>: 0</b>
<b>Course Form</b>	<b>: Lectures, Exercises</b>

### **Learning objectives**

#### **In the 1st course of Pathological Physiology, students will**

- acquire knowledge about characteristics of disease / pathological states and the role of internal and external factors in their development;
- study molecular, cellular, organ and systemic mechanisms of pathogenesis of major symptoms, syndromes, and diseases, including:
  - o inflammation, fever, disorders of nutrition, macro- and microelements' balance, water, ion and acid-base balance, lipid carbohydrate and protein metabolism
  - o typical disorders of the blood, hemostasis and the immune system
  - o major disorders and diseases of the digestive system
  - o major disorders and diseases of the nervous system
- *learn the basic terminology of the description of diseases / pathological conditions and their course, study important connections between pathophysiology and clinical disciplines, interpret uncomplicated model cases of patients with disorders of metabolism, coagulation, immunity, digestive and nervous system*

### **Learning outcomes**

#### **After completing the course, students should be able to**

- demonstrate a basic understanding of the concepts and elements of disease
- discuss etiology, pathogenesis, major clinical and laboratory manifestations of typical diseases / pathological processes
- *apply acquired knowledge for interpretation of uncomplicated model cases of patients with disorders of metabolism, coagulation, immunity, digestive and nervous system*
- understand the basis of the major laboratory tests and other diagnostic procedures related to the above-mentioned disorders
- understand principles of treatment of disorders of coagulation, immunity, digestive and nervous system
- be prepared to make correlations between pathophysiology and information they will be learning in their subsequent preclinical and namely clinical subjects.

**Lectures:**

Teacher: Professor(s) of the dept., event. guest teachers  
 Study: Continuous  
 Time: 11:45 - 13:15 (Mondays)  
 Location: Left Lecture Hall

	Date	Title	Duration (hrs).
1	19. 9. 2022	Introduction. History and contents of the subject.	2
2	26. 9. 2022	General mechanisms of diseases.	2
3	3. 10. 2022	Pathogenetic principles at the gene level.	2
4	10. 10. 2022	Pathophysiology of nutrition.	2
5	17. 10. 2022	Pathophysiology of water and salt balance.	2
6	24. 10. 2022	Acid-base disturbances.	2
7	31. 10. 2022	Pathophysiology of the gastrointestinal tract.	2
8	7. 11. 2022	Pathophysiology of the liver.	2
9	14. 11. 2022	Pathophysiology of blood clotting.	2
10	21. 11. 2022	Pathophysiology of blood and hemopoietic tissues.	2
11	28. 11. 2022	Pathophysiology of the immune system.	2
12	5. 12. 2022	Pathophysiology of central nervous system I.	2
13	12. 12. 2022	Pathophysiology of central nervous system II.	2
14	19. 12. 2022	Aging of the organism.	2
15	2. 1. 2023	Summary from winter term.	2

**Exercises:**

Teacher: Assistant Profs. / Lecturers  
 Study: Continuous

	Date	Title	Duration (hrs.)
1	22. 9. 2022	Introduction, organization of the course. Health and disease. Pathophysiology of fever.	3
2	29. 9. 2022	Pathophysiology of inflammation. Wound healing, reparation and restitution.	3
3	6. 10. 2022	Pathophysiology of external factors contributing to the development of disease.	3
4	13. 10. 2022	Pathophysiology of food intake and nutritional status. Midterm test No. 1 (the content of weeks 1-3). <i>Analysis of body composition by bioelectrical impedance.</i>	3
5	20. 10. 2022	Water and salt balance. Pathophysiology of edemas. Disorders of microcirculation and lymphatic circulation.	3
6	27. 10. 2022	Acid-base disturbances. <i>Examination of lactate, principles and applications in diagnostics.</i>	3
7	3. 11. 2022	Pathophysiology of the esophagus, stomach and intestines.	3
8	10. 11. 2022	Selected problems of the pathophysiology of the liver, biliary tract and exocrine pancreas. Midterm test No. 2 (the content of weeks 4-7).	3

9	17. 11. 2022	<b>Holiday.</b> Disorders of hemostasis. Bleeding disorders.	3
10	24. 11. 2022	Pathophysiology of blood. Anemia. Leukopenia and leukocytosis.	3
11	1. 12. 2022	Pathophysiology of the immune system.	3
12	8. 12. 2022	Disorders of the central and peripheral nervous system I. <b>Midterm test No. 3 (the content of weeks 8-11).</b>	3
13	15. 12. 2022	Disorders of the central and peripheral nervous system II. <i>Discussion of pathophysiological mechanisms using a simulator. Heart rate variability analysis.</i> <b>Credit.</b>	3
14	22. 12. 2022	Pathophysiological interpretation of the model cases, <i>discussion of simplified cases with illustrative examples of pathophysiological mechanisms/diseases.</i> <b>Credit. Credit test.</b>	3
15	5. 1. 2023	<b>Credit. Credit test. Substitutions of absences confirmed by the relevant document.</b>	3

The practical exercises are held in the seminar room of the Department of Pathophysiology on Thursdays, from 8.00 a.m. to 10.15 a.m. - group C and from 10.30 a.m. to 12.45 p.m. - group A.

Control Midterm tests in the 4<sup>th</sup>, 8<sup>th</sup> and 12<sup>th</sup> teaching week are mandatory. The way of their implementation will be specified at the beginning of the semester.

### Completed by: Credit

**Credit conditions are as follows:**

- 1) 100% participation in practical exercises. The 15<sup>th</sup> teaching week is reserved for the substitution of justified absences (health or other serious reasons).
- 2) The readiness of students for the study course, which is continuously monitored. The unpreparedness of the student, i.e. basic ignorance from the material covered in previous lessons and also inadequate knowledge of basic of physiology, biochemistry, etc., may be a reason for exclusion from the lesson and the need to substitute it after the student adequately prepares.
- 3) Compulsory completion of all three control Midterm tests in terms specified in the syllabi (in case of duly excused absence due to health or other serious reasons, the test will be substituted in term by agreement with the assistant professor) with a total average success rate of at least 2/3 (i.e. a total average of at least 66.7%).
- 4) Passing a credit test with the possibility of two retakes in the form of an oral discussion.

*Midterm tests and credit test contain questions from the theoretical and practical part of the study course, including a discussion of pathophysiological mechanisms based on teaching on a simulator, eventually a discussion of simplified model cases.*

*Note: It cannot be ruled out that the form of practical teaching and the implementation of the end of the semester may be subject to partial changes, e.g., in connection with the epidemiological situation.*

**Literature:**

1. Porth's Pathophysiology: Concepts of Altered Health States (9<sup>th</sup> Edition) by Sheila Grossman, Carol Mattson Porth. Wolters Kluwer Health | Lippincott Williams & Wilkins, 2014.
2. McCance K. L., Huether S. E.: Pathophysiology. 8<sup>th</sup> Edition. Mosby, 2018.
3. Silbernagl S, Lang F. Color Atlas of Pathophysiology, 3<sup>rd</sup> Ed. Thieme, 2016.
4. <https://pfyziol.upol.cz/>

*For revision e. g.* Silbernagl S, Despopoulos A. Color Atlas of Physiology. 7<sup>th</sup> edition. Thieme, 2015.