

Name of the course	Pathophysiology			Code	MSE302
Type of study program:	Integrated university study, Medicine			Year of study:	3
Credits (ECTS):	11.0	Semester:	V	Number of hours per semester (l+s+e)	135 (45+60+30)
Status of the course:	obligatory	Preconditions:	According to the Rulebook	Comparative conditions:	/
Access to course:	Third year students			Hours of instructions:	According to schedule
Course teacher:	Full Professor Zlatko Trobonjača, MD, PhD				
Consultations:	As agreed with students				
E-mail address and phone number:	zlatko.trobonjaca@uniri.hr + 385 91 165 1240				
Associate teachers	Assoc Professor Hrvoje Jakovac, MD, PhD Borko Rajić, MSc, MD Marija Šandrak, MSc, MD Benjamin Palić, MD Ivana Bjelanović, MD Ante Mandić, MD				
Consultations:	As agreed with students				
E-mail address and phone number:	hrvoje.jakovac@medri.uniri.hr borkorajic@gmail.com marija.sandrak@gmail.com benjamin314palic@gmail.com bjelanovic.ivanaaa@yahoo.com ante.mandic@live.com				
The aims of the course:	The main aim of this course is to enable students to apply the previously acquired knowledge from all subjects of the first two years of study, especially from the course of Physiology, in order to acquire knowledge about pathological function of certain organ systems and etiopathogenetic mechanisms leading to dysfunction and disease occurrence.				
Learning outcomes (general and specific competences):	<p><u>General outcomes</u></p> <ol style="list-style-type: none"> 1. To develop the ability to integrally consider and explain the role and the consequences of the disturbed homeostatic processes in the body 2. To develop the ability to individually use literature, critically evaluate media or scientific publications about normal and pathological function of human organism, correctly use arguments and competently discuss about pathophysiological issues 3. To become qualified to use Internet and to be able to obtain information from other electronic resources 4. To improve the idea about interdisciplinary nature of biomedical sciences 5. To gain the knowledge necessary for professional development and medical carrier (independent work, work and time consume planning, organisational skills) 6. To improve the level of oral and written communication which will enable them to explain and discuss the meaning and the range of medical knowledge and to communicate with patients 7. To be able to evaluate the significance of modern biomedical techniques in the development of science and business, particularly in the field of biotechnology <p><u>Specific outcomes</u></p> <p>After attending the Pathophysiology course students are expected to:</p> <ol style="list-style-type: none"> 1. explain the principles of physiological feedback, know how to determine the homeostatic mechanisms of the major functional systems, and explain the pathophysiological principles of the disease; 2. recognize the relativity of etiologic factors, distressors, stressors and stimuli in relation to the origin, development and intensity of the etiopathogenic processes; 3. describe the relationships between organic systems in a healthy person and the pathogenic mechanism of major systemic diseases; 				

	<ol style="list-style-type: none"> 4. acquire basic knowledge for the interpretation of general reaction forms of the organism and for understanding of the basic pathophysiological processes in systematic response; 5. integrate and interpret etiopathogenic processes; 6. describe and explain the principles of basic functional tests and recognize deviations from normal values; 7. analyze and interpret graphical schemes and descriptions of etiopathogenetic relationships in clinical, experimental and laboratory data; 8. evaluate the functional reserve of the functional system, and to understand latent insufficiency tests; 9. describe major pathophysiological processes at the cellular level; 10. explain the pathogenic causes, course and consequences of energy metabolism disorders; 11. understand the etiopathogenic factors of malignant transformation of human cells; 12. describe the disorders in blood and plasma composition, and the disorders in maturation and function of the hematopoetic organs; 13. describe the main etiologic factors and pathogenic mechanisms that cause disorders in the function of the immune system; 14. describe basic etiologic factors and pathogenetic mechanisms that cause disorders in the function of the heart, circulatory system, urogenital system and respiratory system; 15. explain the disturbed metabolism of basic and specific nutrients and mechanisms responsible for the disturbed function of the gastrointestinal, hepatobiliary and endocrinological systems; 16. recognize and interpret acid-base balance disorders and disorders of electrolytic homeostasis; 17. describe the osmolality and hydration disorders of the body, and the distribution of fluid in the body; 18. describe specific disorders of individual organs function in aging. 			
Course content (Syllabus):	<p>The course is performed in the winter semester at the third year of study, in the form of lectures (34 teaching hours), seminars (60 teaching hours), and practicals (30 teaching hours of exercises). Lectures last 2, and seminars and practicals 3 teaching hours. Details are provided in the Annexes: calendar classes below.</p>			
Format of instruction: (mark in bold)	Lectures	Exercises	Seminars	Independent assignments
	Consultations	Work with mentor	Field work	Other
	<p>A) Lectures are a form of classes that provide an introduction and an overview of a thematic unit that is taught in more detail on seminars and practicals. B) Seminars and C) practicals are a form of classes where students actively review and critically discuss physiological and pathophysiological mechanisms (of certain morphological and functional units), which are then explained at the molecular, microenvironmental, organic, systemic and whole-organism level. Active participation of students in the curriculum program is further achieved by D) studying natural integrators of etiopathogenetic events, the so-called etiopathogenetic clusters, E) performing practicals in the laboratory and on computer programs that simulate pathological conditions and provide clinical correlates of certain diseases.</p>			
Student responsibilities:	<p>Class attendance and student participation in all forms of classes are compulsory in accordance with the Law and the Statute of the School of Medicine in Mostar. Accordingly, student attendance at lectures, seminars, and practicals will be regularly checked. Only justifiable absences due to, for example, illness will be acceptable within the limits allowed and according to the Ordinance on Studies.</p> <p>The student is obligated to prepare in advance the predefined material that is being discussed on seminars and practicals. The teacher/course coordinator continuously evaluates student participation throughout seminars and practicals (demonstrated knowledge, the ability to correlate morphological, ultrastructural, biochemical and/or functional factors into a complete image of physiological functional systems and</p>			

	certain diseased states). Student activity during classes (lectures, seminars, practicals) is certified in the daily work log.			
Screening student work: (mark in bold)	Class attendance	Class participations	Seminar essay	Practical training
	Oral exam	Written exam	Continuous assessment	Essay

Detailed evaluation within a *European system of points*

STUDENTS RESPONSIBILITIES	HOURS	PROPORTIONS OF ECTS CREDITS	PROPORTIONS OF GRADE
Class attendance and participations	135	4.5	0%
Partial test x2	65	2.17	80%
Final Written exam	95	3.17	
Oral exam	35	1.16	20%
Total	330	11	100%

Further clarification:

Student work will be evaluated during classes and at the final exam. A maximum of **(I) 30 grade points** can be obtained during classes and up to **(II) 70 grade points** at the final exam, which totals **100 grade points**.

I. The following components are evaluated during classes (up to 30 grade points):

- 1) acquired knowledge **(up to 20 grade points)**
- 2) active participation in classes **(up to 10 grade points)**

1) acquired knowledge (up to 20 grade points)

During classes, acquired knowledge will be evaluated by means of **two midterm tests comprising 50 questions**.

A student may obtain up to **10 grade points** on each test as follows:

Correct answers	Grade points
48-50	10
45-47	9
42-44	8
39-41	7
36-38	6
33-35	5
30-32	4
27-29	3
24-26	2
21-23	1

2) active participation in classes (up to 10 grade points)

Based on oral discussions and/or written tests, student knowledge is graded at all seminar and practical classes. A student can obtain grade points during classes only if they were **graded** at least on 10 seminars and 5 practicals. Students will be graded in the range from 1 to 5. The score scale is determined according to the absolute distribution of mean values of grades, which is achieved by summing all grades from seminars and exercises (a total of 30 teaching units) and dividing by number 30 (or less if the student was justifiably absent or not graded). The obtained average grade is converted into grade points as shown in the table:

4,26-5,0	10 points
3,76-4,25	8 points
3,26-3,75	6 points
2,76-3,25	4 points
2,00-2,75	2 points

II. Final exam (up to 70 grade points):

The final exam consists of an oral and a written part. A student must solve **at least 50% of the test** in order to access the oral part of the final exam.

Who can NOT access the final exam:

Students who missed 30% or more teaching hours. Such a student cannot take the final exam, i.e. he/she must re-enroll the course in the following academic years.

Student can obtain a maximum of 70 grade points at the written part of the final exam (100 questions) that corresponds to the total number of grade points as shown in the table:

Correct answers	Grade points	Correct answers	Grade points
97-100	70	68-69	57
94-96	69	66-67	56
91-93	68	64-65	54
88-90	67	62-63	52
86-87	66	60-61	50
84-85	65	58-59	48
82-83	64	56-57	46
80-81	63	54-55	44
78-79	62	52-53	42
76-77	61	50-51	40
74-75	60	<50	0
72-73	59		
70-71	58		

III. The final grade (a maximum of 100 grade points)

The final grade represents the sum of all grade points obtained during classes and at the final exam. It is based on the absolute distribution according to the following scale:

A (91-100 grade points)	excellent (5)
B (79-90- grade points)	very good (4)
C (67-78 grade points)	good (3)
D (55-66 grade points)	sufficient (2)
F (student who has solved less than 55% of the test at the final exam)	insufficient (1)

IV. The final grade obtained on the written test has to be confirmed at the oral exam

Required literature:	<ol style="list-style-type: none"> 1. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. 2. Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. 3. Kovač Z. et al. Clinical Pathophysiology – Etiopathogenetic Nodes (Third Book: I-IV part). Medicinska naklada Zagreb 2013.
Optional literature:	<ol style="list-style-type: none"> 1. Ganong, W.F. Review of Medical Physiology, (21st edition) Lange Medical Books / McGraw-Hill, Medical Pub. Division, New York 2004. 2. McPhee, S.J., Ganong, W.F. Pathophysiology of Disease. An introduction to

	Clinical medicine, (5 th edition), Lange Medical Books / McGraw-Hill, Medical Pub. Division, New York 2006.
Additional information about the course	

Annexes: calendar classes.

The number of teaching units	TOPICS AND LITERATURE
I.	Title: Lecture 1: Introduction to pathophysiology. General causes and development of pathophysiological processes. Homeostatic maintenance and disorders. Health and disease. An integrative approach to the disease. Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7 th edition), Medicinska naklada Zagreb, 2014. Pages: 19.-38.
II.	Title: Lecture 2: Principles of the pathogenetic mechanisms. Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7 th edition), Medicinska naklada Zagreb, 2014. Pages: 38.-74.
III.	Title: Lecture 3: Inflammation. Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7 th edition), Medicinska naklada Zagreb, 2014. Pages: 760.-803. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13 th edition), Elsevier, 2016. Pages:455.-463.
IV.	Title: Lecture 4: Endogenous bioactive compounds in disease processes. Short description: Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7 th edition), Medicinska naklada Zagreb, 2014. Pages: 551.-611.
V.	Title: Lecture 5: Immunopathophysiology. Immunopathogenetic role of the HLA system. Tissue transplant reactions. Short description: Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7 th edition), Medicinska naklada Zagreb, 2014. Pages: 682-695 and 739.-753.
VI.	Title: Lecture 6: Immunodeficiency. Autoimmunity. Short description: Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7 th edition), Medicinska naklada Zagreb, 2014. Pages: 705.-733.
VII.	Title: Lecture 7: Malignant transformation and growth. Disorders of energy metabolism. Short description: Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7 th edition), Medicinska naklada Zagreb, 2014. Pages: 208-246 and 938.-988.
VIII.	Title: Lecture 8: Red blood cells disorders. Short description: Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7 th edition), Medicinska naklada Zagreb, 2014. Pages: 1148.-1164. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13 th edition), Elsevier, 2016. Pages:452.-453.
IX.	Title: Lecture 9: White blood cells disorders. Short description: Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7 th edition), Medicinska naklada Zagreb, 2014. Pages: 1164.-1180. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13 th edition), Elsevier, 2016. Pages:463.-464..
X.	Title: Lecture 10: Disorders of myocardial function. Disorders of the heart valve function. Congenital heart defects. Cardiac filling disorders. Cardiac output disorders. Short description: Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7 th edition), Medicinska naklada Zagreb, 2014. Pages: 1209.-1239., 1267.-1271. and 1302.-1309. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13 th edition), Elsevier, 2016. Pages:248.-258. and 283.-291.
XI.	Title: Lecture 11. The coronary circulation and ischemic heart disease. Short description:

	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 1253.-1267. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. Pages:262.-269.
XII.	Title: Lecture 12. Disorders of arterial pressure. Hypertension. Local tissue perfusion disorders.
	Short description:
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 1309.-1326. i 1333.-1348. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. Pages:232.-241.
XIII.	Title: Lecture 13. Circulatory Shock.
	Short description:
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 843.-861. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. Pages:293.-302.
XIV.	Title: Lecture 14. Overview of the renal functions disorders.
	Short description:
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 1388.-1434. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. Pages:427.-441.
XV.	Title: Lecture 15. Overview of the respiratory system disorders.
	Short description:
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 1351.-1385. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. Pages:549.-557.
XVI.	Title: Lecture 16. Chronobiological pathophysiology.
	Short description:
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 885.-933.
XVII.	Title: Lecture 17. Pathophysiology of gastrointestinal system.
	Short description:
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 1453.-1487. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. Pages:843.-849.
XVIII.	Title: Lecture 18. Disorders of pancreatic endocrine function. Diabetes mellitus.
	Short description:
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 250.-265. and 536. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. Pages:994.-999.
XIX.	Title: Lecture 19. Integral organismic reactions to noxious stimuli.
	Short description:
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 804.-841.
XX.	Title: Lecture 20. Causes of endocrinopathies. Disorders of pituitary function. Thyroid gland disorders.
	Short description:
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 494.-526. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. Pages:946.-948. i 959.-963.
XXI.	Title: Lecture 21. Functional disorders of the cortex and medulla of the adrenal gland.
	Short description:
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 526.-536. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. Pages:979.-981.
XXII.	Title: Lecture 22. Disorders of gonadal function.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 539.-544. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. Pages:1033.-1034. and 1051.-1054

XXIII.	Title: Lecture 23. Disorders of parathyroid glands function. Disorders of calcium, phosphate and magnesium metabolism.
	Short description:
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 424.-438. and 536.-539. and 354 Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016.Pages:1014.-1016.
Teaching units	SEMINARS: TOPICS AND LITERATURE
I.	Title: Seminar 1: Pathophysiology of DNA: DNA damages, chromosomal aberrations, genomic instability. Gene expression disorders. Hereditary metabolic diseases.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 77.-151.
II.	Title: Seminar 2: Functional disorders of subcellular structures.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 160.-201.
III.	Title: Seminar 3: Function and composition disorders of blood and hematopoietic organs.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 1148.-1194.
	Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016.Pages: 452.-453. and 490.-493.
IV.	Title: Seminar 4: Immune hypersensitivities and transfusion reactions.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 733.-739. and 749.-753.
V.	Title: Seminar 5. Disorders of impulse conduction. Heart rhythm disorders. Heart adaptation to the functional load.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 1239.-1253. i 1271.-1281.
	Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016.Pages: 155.-165.
VI.	Title: Seminar 6. Cardiac Failure.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 1281.-1294.
	Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016.Pages: 271.-280.
VII.	Title: Seminar 7. Disorders of arterial pressure and blood flow.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 1309.-1344.
	Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016.Pages: 232.-241.
VIII.	Title: Seminar 8. Circulatory Shock.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 843.-861.
	Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016.Pages: 293.-302.
IX.	Title: Seminar 9. Disorders of osmolality and hydration of the body. Disorders of extracellular fluid distribution.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 383.-403.
	Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016.Pages: 312.-320.
X.	Title: Seminar 10. Disorders of urine quantity and composition.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 1434.-1445.
XI.	Title: Seminar 11. Pathophysiology of the respiratory system.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 1351.-1385..
	Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016.Pages: 549.-557. and 515.
XII.	Title: Seminar 12. Disorders of electrolytic homeostasis.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 403.-424.
XIII.	Title: Seminar 13. Acid-base balance disorders.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 449.-487.
	Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016.Pages: 421.-426.

XIV.	Title: Seminar 14. Disorders of metabolism of proteins and carbohydrates. Disorders of dietary balances.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 250.-265. i 291.-308. i 223.-234. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. Pages: 894.-897.
XV.	Title: Seminar 15. Lipid metabolism disorders. Atherosclerosis.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 265.-291. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. Pages: 994.-999. i 872.-874.
XVI.	Title: Seminar 16. Pathophysiology of the liver.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 1493.-1536.
XVII.	Title: Seminar 17. Disorders of energy metabolism. Disorders of thermoregulation.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 208.-246. and 661.-681. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. Pages: 919.-922.
XVIII.	Title: Seminar 18. Disorders of specific metabolic substances.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 328.-376.
XIX.	Title: Seminar 19. Structural and functional disorders of connective and bone tissue.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 1125.-1144.
XX.	Title: Seminar 20. Disorders of neurovegetative regulation. Disorders of consciousness.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 614.-635. i 864.-881.
Teaching units	PRACTICALS: TOPICS AND LITERATURE
I.	Title: Practical 1: Leukocytes and the monocyte-macrophage system disorders. Biological etiological factors.
	The pathogenesis of multiple organ failure, sepsis and SIRS Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 1164.-1180. and 1088.-1122.
II.	Title: Practical 2. Physical and chemical etiological factors.
	Mushroom poisoning-acute liver failure Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 993.-1043. and 1050.-1085.
III.	Title: Practical 3: Disorders of the composition and structure of plasma protein. Function disorders of the spleen. Haematological laboratory tests.
	Pathological fracture + Hyperviscosity of blood Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 1194.-1206.
IV.	Title: Practical 4: Hemostasis and blood clotting disorders.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 1180.-1194.
V.	Title: Practical 5. Electrocardiographic interpretation of disorders of the heart muscle and coronary circulation - Vectorial analysis
	Literature: Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. Pages: 139.-153.
VI.	Title: Practical 6. Cardiac arrhythmias and their electrocardiographic Interpretation. Pathological electrocardiogram.
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 1239.-1253. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. Pages: 155.-165.
VII.	Title: Practical 7. Disorders of the digestive system and metabolism.
	I. Theoretical part:
	To understand the material discussed in lectures (L17.) and seminars (S14., S15, S16.). This material comprises the pathophysiology of the digestive system, impaired metabolism of proteins, carbohydrates and lipids, and nutritive disorders.
	Etiopathogenetic cases:

	a) Pathophysiology of gluten enteropathy.
	b) Pathogenesis of diarrhea in cholera syndrome
	c) Pathophysiology of peptic disease in gastrinoma (Zollinger - Ellis syndrome).
	Etiopathogenetic nodes: Hypoglycemia + Hyperglycemia
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 250.-314. and 1453.-1487. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. Pages: 846.-849. i 872.-874. i 894.-897. i 994.-999.
VIII.	Title: Practical 8. Pathophysiology of the liver and exocrine pancreas.
	I. Theoretical part:
	To understand the material discussed in the lecture and seminar (L17 and S16). This material covers the field of pathophysiology of the hepatobiliary system and the field of pathophysiology of the exocrine pancreas.
	Etiopathogenetic cases:
	a) Pathophysiology of liver cirrhosis.
	b) Pathophysiology of obstructive jaundice caused by cholelithiasis.
	Short description:
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 1493.-1537. i 1474.-1478.
IX.	Title: Practical 9. Disorders of conception, pregnancy, fetal growth and development. Disorders of sexual function.
	I. Theoretical part:
	To understand the material discussed in the lecture (L21.). This material covers the area of pathophysiology of reproductive functions and sex hormones.
	Etiopathogenetic cases:
	a) Pathophysiology of postmenopausal osteoporosis.
	Short description:
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 539.-544. i 885.-919. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. Pages: 1051.-1053.
X.	Title: Practical 10. Endocrinopathies.
	I. Theoretical part:
	Understand the material discussed in the lectures (contents L19., L20., L21 and L22.) This material covers the field of pathophysiology of general endocrinology, pituitary hormones, metabolic hormones of the thyroid gland, adrenal cortex hormones, parathyroid hormone and calcitonin.
	Etiopathogenetic cases:
	a) Pathophysiology of hyperfunctional thyroid adenoma.
	Short description:
	Literature: Gamulin S., Marušić M., Kovač Z. Pathophysiology (7th edition), Medicinska naklada Zagreb, 2014. Pages: 497.-539. Guyton A.C., Hall J.E. Textbook of Medical Physiology (13th edition), Elsevier, 2016. Pages: 946.-948. i 960.-963. i 979.-981. i 1014.-1016.