

Study program: Integrated academic studies in medicine	
Type and level of the study program: integrated academic studies	
Course title: Pathological physiology (M3-PPHYS)	
Teacher: Vučković A. Biljana, Žeravica R. Radmila, Ilinčić P. Branislava, Mijović R. Romana, Mitić P. Gorana	
Course status: compulsory	
ECTS Credits: 17	
Condition: Physiology; Medical biochemistry and chemistry	
Course aim Enabling students to understand the etiology and pathogenesis of diseases and to understand alterations of specific organ and organ systems functions in order to successfully transfer from preclinical to clinical disciplines.	
Expected outcome of the course: Knowledge: Acquiring knowledge about pathophysiological alterations, etiological factors as well as developing pathogenetic mechanisms in developing different diseases. Exploring general principles in organ function and organ system disorders. Skills: Student should be introduced with principles for performing and the interpretation of functional examinations of biochemical, haematological, immunometric and other analysis and tests that are used in diagnostics of different pathophysiological alterations.	
Course description <i>Theoretical education</i> 1. Introduction to pathophysiology. Etiology and pathogenesis of diseases. 2. Mechanism of inflammatory reaction and the role of mediators. 3. Fever - mechanism, types and pathophysiological significance. 4. Disorders of barriers and functions of phagocytes. 5. Disorders of protein metabolism (I-III). 6. Disorders of carbohydrate metabolism (I-III). 7. Disorders of lipid metabolism (I). 8. Disorders of lipid metabolism II and atherosclerosis. 9. Disorders of body fluid and electrolyte balance (I-IV). 10. Disorders of acid-base balance (I-II). 11. Calcium metabolism and parathyroid disorders. 12. Disorders of neural and humoral regulation (I-II). 13. Pituitary disorders and general adaptation syndrome. 14. Disorders of the hypothalamic-pituitary-gonadal axis. 15. Disorders of the hypothalamic-pituitary-adrenal (HPA) axis. 16. Disorders of the hypothalamic-pituitary-thyroid axis. 17. Disorders of the hypothalamic-pituitary-thyroid axis. 18. Mechanisms of autoimmune diseases. 19. Immunodeficiency. 20. Hypersensitivity (I-II). 21. Red blood cell disorders. 22. Red blood cell disorders. 23. Disorders of protein metabolism IV; Porphyria; Hemoglobinopathies. 24. White blood cell disorders (I-II). 25. Disturbance of energy balance malnutrition. 26. Disturbance of energy balance obesity. 27. Disorders of water and minerals metabolism. 28. Pathophysiology of aging. 29. General and local effects of cold on the human body. 30. Local effects of heat on the human body. 31. General effects of heat on the human body. 32. Effects of ionizing radiation on the human body. 33. Effect of chemical factors on the human body. 34. Effects of electricity and electromagnetic waves on the human body. 35. Effect of chemical factors on the human body. 36. Effect of increased/ reduced atmospheric pressure on the human body. 37. Hereditary disorders (I-II). 38. Mechanism of heart insufficiency. 39. Classification and types of heart insufficiency. 40. Pathophysiological disturbances in the congenital heart diseases. 41. Pathophysiological disturbances in the acquired heart valve diseases. 42. Heart rhythm disorders - etiology and pathogenesis. 43. Pathophysiology of coronary insufficiency. 44. Myocardial and pericardial diseases. Pulmonary hypertension. 45. General pathophysiology of arterial hypertension. 46. Pathophysiology of arterial hypotension, disorders of peripheral circulation. 47. Pathophysiology of hemostatic disorders (I-V). 48. Pathophysiology of the digestive tract (I-VI). 49. Pathophysiology of disordered hepatic function (I-V). 50. Pathophysiology of the uropoietic system (I-V). 51. Pathophysiology of the nervous system – sensibility disorders. 52. Pathophysiology of the nervous system – motor function disorders and epilepsy. 53. Pathophysiology of the nervous system – disorders of consciousness, sleep and cerebral circulation. 54. Pathophysiology of the nervous system – pain, headache, and neurotransmission disorders. 55. Pathophysiology of malignancy (I-II). 56. Pathophysiology of musculoskeletal disorders (I-III) <i>Practical classes</i> 1. Functional evaluation in medicine. Interpretation of organ function tests. 2. Functional evaluation in inflammation. 3. Functional evaluation of protein metabolism. 4. Functional evaluation of carbohydrate metabolism. 5. Functional evaluation of lipid metabolism. 6. Functional evaluation of fluid metabolism disorders. 7. Functional evaluation of immune system. 8. Functional evaluation of parathyroid gland and bone metabolism. 9. Functional evaluation of the pituitary gland and gonads. 10. Functional evaluation of adrenal glands. 11. Functional evaluation of the thyroid gland. 12. Functional evaluation of red blood cells (I-II). 13. Basic functional studies of white blood cells (I-II). 14. Functional evaluation of hemorrhagic syndromes (I-II). 15. Functional evaluation of the respiratory system (I-II). 16. Functional evaluation of the cardiovascular system (I-II). 17. Functional evaluation of the digestive system. 18. Functional evaluation of exocrine pancreatic cells. 19. Functional evaluation of the liver. 20. Functional evaluation of the liver and biliary duct. 21. Functional evaluation of the nervous system. 22. Laboratory analysis of malignant neoplasms. 23. Functional evaluation of the uropoietic system (I-III). At the end of the semester student knowledge will be evaluated by test.	
Literature <i>Compulsory</i> 1. Hammer GH, Mc Phee JS, eds. Pathophysiology of disease. An Introduction to Clinical Medicine. 7th ed. Lange Medical Books/Mc Graw-Hill;2014. 2. Huether SE, Mc Cance KL, eds. Understanding Pathophysiology. 6th ed. Elsevier Science;2016. <i>Additional</i> 1. Silbernagl S, Lang F. Color Atlas of Pathophysiology. Thieme;2016. 2. Porth C. Essentials of Pathophysiology: Concepts of Altered States. Lippincott Williams and Wilkins;2014.	
Number of active classes	Other:

Lectures: 90	Practice: 120	Other types of teaching:	Research related activities:	
Teaching methods: interactive theoretical and practical education; consultation; seminars; pre test consultation.				
Student activity assessment (maximally 100 points)				
Pre-exam activities	points	Final exam	points	
Lectures	15	Written	15	
Practices	15	Oral	45	
Colloquium	10		
Essay				