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|  | | | **UNIVERSITY OF EAST SARAJEVO**  **Faculty of Medicine** | | | | | | | | | | | |  | | | | |
| ***Study program: medicine*** | | | | | | | | | | | |
| Integrated academic studies | | | | | | III study year | | | | | |
| **Full subject title** | | | PATHOLOGICAL PHISIOLOGY | | | | | | | | | | | | | | | | |
| **Department** | | | Department of preclinical subjects, Faculty of Medicine in Foča | | | | | | | | | | | | | | | | |
| **Subject code** | | | | | | **Subject status** | | | | | **Semester** | | | | **ECTS** | | | | |
|
| МЕ-01-1-024-5; МЕ-01-1-024-6 | | | | | | compulsory | | | | | V, VI | | | | 13 | | | | |
| **Professor/ -s** | | Full professor Mirjana Miric, MD, PhD; Full professor Vladimir Jurisic,MD PhD, assistant professor Ivan Radić, MD,PhD | | | | | | | | | | | | | | | | | |
| **Associate/ - s** | | senior assistant Svjetlana Subotic MD; senior assistant Bojan Joksimovic MD, senior assistant Milos Vasiljevic, MD | | | | | | | | | | | | | | | | | |
| **Number of lectures/ teaching workload (per week)** | | | | | | | **Individual student workload (in hours per semester)** | | | | | | | | | **Coefficient of student workload So[[1]](#footnote-2)** | | | |
| **L** | **E** | | | | **SP** | | **L** | | | **E** | | **SP** | | | | **L** | | | |
| 3 | 3 | | | | 0 | | 45 | | | 45 | | 0 | | | | 1,167 | | | |
| 2 | 4 | | | | 0 | | 30 | | | 60 | | 0 | | | | 1,167 | | | |
| total teaching workload (in hours, per semester)  3\*15 + 3\*15 + 0\*15 = 90  2\*15 + 4\*15 + 0\*15 = 90 | | | | | | | | total teaching workload (in hours, per semester)  3\*15\*1,167 + 3\*15\*1,167 + 0\*15\*1,67 = 105  2\*15\*1,167 + 4\*15\*1,167 + 0\*15\*1,67 = 105 | | | | | | | | | | | |
| Total subject workload (teaching + student): 180 + 210 = 390 hours | | | | | | | | | | | | | | | | | | | |
| **Learning outcomes** | | 1. Through the general and special pathological physiology, the student is introduced to the different causes of the disease and their mechanism of action.  2. It needs to know the mechanisms of the disease and its consequences from the cellular level to the level of the organism as a whole.  3. Understanding the connection between the basic clinical manifestation of the most important functional and organic disorders with the causes and mechanisms of their formation.  4. Knowledge of the place and importance of laboratory and functional tests. | | | | | | | | | | | | | | | | | |
| **Preconditions** | | Passed exam in Anatomy, Histology and Embryology, Physiology and Biochemistry.  Requirement for taking the exam: all passed exams from the previous year of study | | | | | | | | | | | | | | | | | |
| **Teaching methods** | | Lectures, seminars and exercises. | | | | | | | | | | | | | | | | | |
| **Subject content per week** | | **Lectures**  1. Place and role of pathological physiology in medicine. Health and wellness  Diseases of manifestation of disease. Current and outcome of diseases. Ethiology: types of ethiological factors and their presence in the onset of disease. Pathogenesis: pathogenetic factors and their significance. Reactivity.  2. The following diseases. Significance of age in the occurrence and development of diseases. Aging theory  3. Ethical factors, risk factors. Termic factors. General and local effect of increased temperature. Clinical manifestations of hyperthermia.  4. Thermal factors. General and local low temperature events.  5. Chemical etiological factors. Ezogenic and endogenous intoxication. Biological etiological factors.  6. Pathophysiological aspects of malignant tumors. Most cell death. Response of tumor-host.  7. Inflammation. Biological inflammatory syndrome. Crop: types, stages and types  8. Defensive mechanisms of the organism. Non-specific protection of the organism. Specific protection of the organism and immunodeficiency  9. State of immunological hypersensitivity. Mechanisms of early and late hypersensitivity. A variety of allergic diseases associated with certain types of hypersensitivity. Autoimmunity, etiopathogenesis and types of autoimmune diseases  10. Carbohydrate metabolism disorders. Hypoglycemic and hyperglycemic syndrome. Synthesis and degradation of glycogen.  11. Disturbance of metabolism of proteins. Comparison of neuroendocrine regulation of protein metabolism. Pathogenesis of hypoproteinemia, hypoproteinemia, and disproteinemia. Disruption of energy balance (imbalance in energy metabolism, positive energy balance, negative energy balance).  12. Pathophysiological Aspects of Enzymopathy. A Comparison of Homeostatic Control of Enzymatic Activity. Types of Enzyme Abnormalities. Functional Effects of Enzyme Deficiency. Pathophysiological Absorbent Balance Apposites. Causes, pathogenesis and consequences of respiratory and metabolic acidosis and alkalosis.  13. Disorders of water metabolism. Ethiology and pathogenesis of the main types of disorders of water and salt metabolism. Intracellular, extracellular and global dehydration. Edema. Mineral transport (hypo and hyperthermia, hypo and hypercholemia, hypo and hyperkalaemia). Pathophysiological principles of correction of water and salt imbalance  14. Kinetics and bone mineral minerals. Negative and positive balance Ca, P, Mg. Balance of the content of essential microelements  15. Disturbance of traffic and metabolism of vitamins.  Avitaminosis, hypovitaminosis, hypervitaminosis of vitamins soluble in water and fats.  16. Disorder of fat metabolism. Hypercholesterolemia. Metabolic and pathogenetic aspects of atherosclerosis. Substance of metabolism of fat as prevalent signs of diabetes  17. Pathological physiology of respiration. Regulation of respiratory centers (neurogenic, humoral, endocrine). Types, mechanism and consequences of hypoxia. Central disorders of breathing rhythm  18. Ventilation disorders. Hyperventilation, hypoventilation, obstruction, restriction,  disorder of ventilation-perfusion relationship. respiratory insufficiency. circulation in the lungs. Excellent edema. Non-epileptic lung function.  19. Heart failure due to changed cardiac function. Treatment of contractility of the heart. Heart failure. Descent of right and left heart failure. Cardiac rhythm disorders. Pathogenesis of arrhythmias. Normalization of impulse. Blown conduction.  20. Hemodynamic disorders that correlate the heart valves. Mitral stenosis and insufficiency. Arterial stenosis and insufficiency. Cardiac filling procedures. Blood flow changes due to changes in arterial pressure. Pathophysiology of arterial hypertension. Pathophysiology of arterial hypotension. Ischemic heart disease. Regulation and disorder of the coronary artery. Metabolic changes in the ischemic heart.  21. Disorder of the function of hematopoietic organs. Border function of the bone marrow. Consequence of bone marrow disorders. Settlement of the function of the spleen. Replication of the red blood cell. Distribution and etiopathogenesis of anemia. Policitemia. Application of a white bloodline. Granulocytosis and monocytosis. Granulocytopenia and agranulocytosis. Granulocytic and monocytic leukemia .  22. Lymphocytic lobe disorder. Lymphocytosis and lymphopenia. Lymphoproliferative disease, lymphatic leukemia and lymphoma. Hemostatic depression. Hemorrhagic syndrome. Platelet disorder. Causes and consequences of vascular haemostasis phase disorders. Coagulation dysfunction  23. Disorders of the digestive tract. Movement of motor and passage. Ethiopathogenesis of ileus. Insulin and diarrhea. Secretion of secretion. Etiopathogenesis of ulcer disease. In the digestive tract. Absorption route. Malásorption syndrome.  24. Disturbance of exocrine function of the pancreas. Treatment of secretion and insufficiency of pancreatic. Etiopathogenesis of pancreatitis. Zollinger-Ellison syndrome. Ulcerogenic tumors. A comparison of some autochtonous functions of the intestine. Regional enteritis. Change of the bacterial flora in the intestines and its poles. Substance of the colonic function. Carcinoma tumors.  25. Liver function disorders: secretory and metabolic function of the liver.  Liver insufficiency. Detection of liver detoxification. Pathogenesis of hepatic coma and encephalopathies  26. Pathophysiology of the kidney. Ethopathogenesis of glomerulopathy. Pathophysiological aspects of tubulopathy. Glomerulotubular water-electrolyte disbalance. Renal vasculopathy  27. Renal insufficiency. Acute and chronic kidney insufficiency. Metabolic and systemic manifestations of urea. Renal syndromes. Pathophysiological aspects of disorders and regulation of endocrine glands. Hormone secretion. Target tissue disorders. Disorder of hormone metabolism. Hormone secretion due to haemostasis disorders  28. Pituitary function disorder. Pituitary opening of the pituitary gland. Disturbance of the back of the pituitary gland hole. Shifting of the thyroid gland function.  Tyreotoxicosis and hyperthyroidism. Hyperthyroidism. Parathyroid gland disorder. Disorder of the adrenal gland function. Hypo and hyper function of the adrenal cortex. Comparison of the function of the core of the adrenal gland. Feohromocytoma. A disorder of the function of endocrine pancreas.ethiopathogenesis of diabetes mellitus.  29. Pathological physiology of the nervous system. The behavior of irritability and conduction of the nerve impulse in normal ionic conditions and in the action of neurotoxins and metabolic inhibitors. Peripheral nervous system regimens. Somatomotor nervous system. Transmission in the function of the pyramidal and extramidal system. The role of the small brain in coordination of the movement. A somato-sensory system disorder.  30. Disturbance of hearing and hearing sensations. Bone-joint disorders.  **EXERCISES**  1. Pathophysiological basics of action of etiological factors (mechanical, thermal, action of electric current, atmospheric pressure action of gases)  2. Verification exercises "etiological factors" and PBL.  3. Inflammation (mechanism of formation, vascular, cellular and metabolic reaction in inflammation.) View by Danilevsky  4. Biological inflammatory syndrome (changes in blood, SE, proteins and immunoglobulins in inflammation)  5. Verification of exercises "inflammation and biological syndrome of inflammation" and PBL.  6. Pathological physiology of local circulation (local arterial and venous hyperaemia, thrombosis, embolism), PBL.  7. Hypersensitivity reactions (I, II, III and IV hypersensitivity)  8. Diagnosis of allergic diseases ((skin, cytology and serological reactions)  9. Verification of the "hypersensitivity reaction and diagnosis of allergic diseases" and PBL.  10. Pathophysiological aspects of shock  (hypovolemic, cardiogenic, anaphylactic, neurogenic, septic)  11. Verification of the "shock" and PBL exercises:  12. An acid-base balance disorder (metabolic acidosis and alkalosis, respiratory acidosis and alkalosis)  13. Disorders of metabolism (fats, proteins and carbohydrates)  14. Verification of exercises "disturbances of acid-base balance and metabolism" and PBL.  15. Test from general pathological physiology.  16. Patosiological basics of electrocardiography (principles of work, frequency determination, rhythm determination and rhythm disorders, determination of electric shaft)  17. Patosiological basics of electrocardiography (determination of hypertrophy, coronary perfusion disorders)  18. Pathophysiological basics of functional examination of the cardiovascular system (invasive and non-invasive diagnostic methods)  19. Verification of exercises from the KVS system and PBL.  20. Pathophysiological basics of functional examination of the respiratory system (examination of ventilation of the lungs, distribution of gases, diffusion of gases, pulmonary perfusion, gas analysis)  21. Verification exercises from the respiratory system and PBL.  22. Pathophysiological basics of functional tests in digestive system examination (digestive tube test, functional gastric examination, functional examination of exocrine pancreas and interpretation of results)  23. Verification exercises from the digestive system and PBL.  24. Pathophysiological basics of hemostasis disorders (functional examination of vascular, thrombocyte and coagulation phases and interpretation of results)  25. Hematology (erythrocyte and leukocyte disorder)  26. Pathophysiological basics of liver function tests (examination of the bilirubin metabolism, role of the liver in the metabolism of proteins, fats and carbohydrates, serum liver enzyme testing, liver detoxification testing, liver blood tests)  27. Verification of hepatic and PBL exercises.  28. Pathophysiological basics of functional tests in endocrine system testing (functional examination of endocrine glands and interpretation of results), PBL.  29. Pathophysiological basics of functional tests in urinary tract examination (diuretic and salurisation disorder, proteinuria, pathological sediment analysis, clearance in urinary tract function) interpretation of results and PBL.  30. Test of special pathological physiology. | | | | | | | | | | | | | | | | | |
| **Compulsory literature** | | | | | | | | | | | | | | | | | | | |
| **Author/s** | | | | **Publication title/ Publisher** | | | | | | | | | **Year** | | | | **Pages (from-to)** | | |
| McCance LK, Huether ES | | | | Pathophysiology:the Biological Basis od Disease in Adults and Children.8 th ed. Mosby | | | | | | | | | 2019 | | | |  | | |
| Vucevic D. and Pesic B | | | | The Pathophysiology Practicum and The Pathophysiology Workbook,Beograd, Libri Medicorum | | | | | | | | | 2009 | | | |  | | |
| **Additional literature** | | | | | | | | | | | | | | | | | | | |
| **Author/s** | | | | **Publication title/Publisher** | | | | | | | | | **Year** | | | | **Pages (from-to)** | | |
| **Student responsibilities, types of student assessment and grading** | | **Grading policy** | | | | | | | | | | | | | **Points** | | | | **Percentage** |
| Pre-exam activities | | | | | | | | | | | | | | | | | |
| Activities during lectures | | | | | | | | | | | | | 10 | | | | 10% |
| Practical work | | | | | | | | | | | | | 20 | | | | 20% |
| colloquium | | | | | | | | | | | | | 10 | | | | 10% |
| Seminar paper | | | | | | | | | | | | | 10 | | | | 10% |
| Final exam | | | | | | | | | | | | |  | | | |  |
| Practical exam | | | | | | | | | | | | 10 | | | | 10% | |
| Written exam | | | | | | | | | | | | 40 | | | | 40% | |
| TOTAL | | | | | | | | | | | | 100 | | | | 100 % | |
| **Certification date** | | December 13 th 2018 | | | | | | | | | | | | | | | | | |

1. The coefficient of student workload So is calculated as it follows:

   а) for the study programs not going through the licensing process: So = (total workload in semester for all of the subjects 900 hrs – total teaching workload L+E in semester for all of the subjects 870 hrs)/ total teaching workload L+E in semester for all of the subjects \_\_\_\_\_ hrs = \_\_\_\_. Consult form content and its explanation.

   b) for the study programs going through the licensing process, it is necessary to use form content and its explanation. [↑](#footnote-ref-2)