Faculty of Medicine / MEDICINE / PATHOLOGICAL PHYSIOLOGY

Course:	PATHOLOGICAL PHYSIOLOGY			
Course ID	**Course status**	**Semester**	**ECTS credits**	**Lessons** (Lessons+Exercises+Laboratory)
28	Mandatory	6	11	3+3+0
Programs	MEDICINE			
Prerequisites	The student is requested to pass exam of Medical Physiology			
Aims	The aim of this subject is to present to students etyological factors and mechanisms which disturb normal functions of cells and cause appearance of functional and morphological changes and understanding of mechanisms of developing and flow of the diseases.			
Learning outcomes	After finishing the two semestral course and passing the exam in pahological physiology,the student of medicine should have the following learning outcomes : 1. The student will have theoretical frame and practical knowlidge and skills about human bodi,s reactions in the diseases. 2. The student will have appropriate pathophysiolohical knowlidge for studie the nosologie of the disorders and illnesses in different general and dental medical areas 3. The student will be able to understand the etiology and pathogenesis of metabolic and functional disorders of organs and systems of organs based on the measurable facts and evidences. 4. The student will be able to connect clinical signes of the diseases with their causes and machanisms of their occurrence, to understand the relationship between clinical signes and the nosologie of the disorders in the different areas. 5. The student will have pathophysiological base to make diagnostic strategie in the case of the appearance of pathological events. 6. The student will be able to understand (using active analysis, comparison and synthesis of every problems) the order of the appearance of pathophysiological precesses and their clinical implications. 7. The student will be able to make correct relationship among biochemical, morfological, ultrastructured, functionals and clinical data and parameters in order to understand the signes and symptoms of different diseases .			
Lecturer / Teaching assistant	Prof.dr Milica Martinović			
Methodology	lectures, practical work (exercises),seminars, first tests (colloquiums)			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Disorders of blood coagulability. Risks of bleeding. Hemorrhagic syndromes. Hypercoagulability of blood.			
I week exercises	Seminar: different types of hemophilia, Syndrome of disseminated intravascular coagulation			
II week lectures	Pathophysiology of the cardiovascular system: damage to the heart valves, congenital and acquired heart defects, hemodynamic consequences. Rheumatic fever.			
II week exercises	Counting of platelets. Determination of aPTT, prothrombin, thrombin time, fibrinogen degradation products. Interpretation Lab. findings of the different functions of hemostatic system disorders			
III week lectures	Heart rhythm disorders. Pathogenesis and hemodynamic consequences of arrhythmia. Ischemic heart disease.Hemodinamske and metabolic changes in the ischemic myocardium			
III week exercises	Electrocardiogram, interpretation of basic elements. Changes in the electrocardiogram typical for certain disorders of cardiac function			
IV week lectures	Customizing the heart load. The dynamics of cardiac hypertrophy. Heart failure.Shock. Disorders of blood pressure,hypertension. Disorders of the local tissue perfusion.			
IV week exercises	Biochemical findings in myocardial infarction: determination of serum concentrations of the enzyme which is the amount of blood increases during heart attack, the dynamics change. Interpretation of pathological ECG findings in different locations of myoca			
V week lectures	Pathophysiology of breathing. Disorders of ventilation alveola. Pathophysiology of asthma.Disorders of diffusion of gases. The pathophysiology of pulmonary edema			
V week exercises	Spirometry: spirometry parameters calculation and interpretation of ventilation disorder obstructive and restrictive type			
VI week lectures	Respiratory insufficiencyDisorders of acid-base status: acidosis and alkalosis.			
VI week exercises	Slides sediment pleural effusion with transudates and exudates. Eosinophils in sputum.			
VII week lectures	Pathophysiology of the gastrointestinal tract: disorders of the pharynx and esophagus functions. Disorders of stomach function. Ulcer disease.Pathophysiology of small intestine, malabsorption.Akutni and chronic pancreatitis.			

VII week exercises	Seminar: disorders of acid-base status of metabolic and respiratory origin, comparatively. Acidosis and alkalosis.
VIII week lectures	Function disorders of the colon. Constipation. Pathophysiological forms of diarrhea. Vomiting. Ileus.
VIII week exercises	Determining the acidity of gastric juice. Breath test for Helicobacter pylori, the interpretation of the findings. Interpretation Lab. findings typical of ulcer disease associated with the pathophysiological basis of the manifestation of symptoms of the d
IX week lectures	Pathophysiology of hepatobiliary tract. Disorders metabolic functions of liver.Disorders of bilirubin metabolism. Jaundice. Pathogenic types of cholestasis.
IX week exercises	Determination of serum alkaline phosphatase activity. Detection of blood in feaces. Steatorrhea . Interpretation of findings typical of digestive pathology associated with clinical manifestations of disorders
X week lectures	Disorders of the composition and functions of bile. The occurrence of gallstones. Disorders of blood flow through the liver. The pathogenesis of portal hypertension. Ascites.
X week exercises	Determination and interpretation of hyperbilirubinemia. Bilirubinuria.
XI week lectures	The pathophysiology of organ systems for the excretion : pre-renal disorders of kidney function. Renal disorders of kidney function. Disorders of glomerular function. Vascular kidney disease. Tubulointerstitial kidney disease.
XI week exercises	Determination of serum aminotransferase activity and gamma glutamyl transferase. Differential diagnosis of jaundice. Interpreting laboratory results typical of the various types of hepatitis, associated with methods of clinical manifestations of disorders
XII week lectures	Postrenal disorders, obstructive uropathy.Acute and chronic renal failure. Disturbance quantity and composition of urine.
XII week exercises	Microscopic examination of the urine.Interpretation of laboratory analysis typical for a variety of disorders: proteinuria, leukocyturia, hematuria, associated with methods of clinical manifestations of disorders
XIII week lectures	Pathophysiology of the nervous system. Neuromuscular disorders. Pathophysiology of epilepsy. Sensitive nervous disorders. Psychosindrome: disorders of consciousness and behavior. Disorders of cerebrospinal fluid and blood-brain barrier.
XIII week exercises	Determination of urea, creatinine and uric acid. Interpretation of laboratory findings typical for different types of disorders of renal function associated with the methods of clinical manifestations of disorders
XIV week lectures	Disorders of the structure and function of connective tissue. Disorders of creating material and connective fibers. Disorders of composition and structure of cartilage, degenerative and inflammatory joint processes
XIV week exercises	Differential diagnosis of cerebrospinal fluid: the counting and differentiation of cell types.Interpretation of laboratory results typical of the various types of meningitis associated with methods of clinical manifestations of disorders
XV week lectures	The pathophysiology of stroke.
XV week exercises	Seminar: pathophysiological aspects of nutritional disorders of brain tissue and clinical implications
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Student workload	Per week: 5.5 credits x 40/30 = 7 hours i 20 minutes Structure:3 hours lectures, 3 hours exercises 1 hour 20 minutes students work, by his/her own Teaching and final exam: (7h 20 min) x 16 = 117 h 20 min Necessary preparations before the beginning of the semester (administration,enrollment,verification) Total load for the subject 5.5 x 30 = 165 hours Additional work for preparation of the exam in correctional term including passing exam from 0 to 33 hours (remaining time from first two week up to total load for the subject 165 hours)

Per week	**Per semester**
11 credits x 40/30=14 hours and 40 minuts 3 sat(a) theoretical classes 0 sat(a) practical classes 3 excercises **8 hour(s) i 40 minuts** of independent work, including consultations	Classes and final exam: **14 hour(s) i 40 minuts x 16 =234 hour(s) i 40 minuts** Necessary preparation before the beginning of the semester (administration, registration, certification): **14 hour(s) i 40 minuts x 2 =29 hour(s) i 20 minuts** Total workload for the subject: **11 x 30=330 hour(s)** Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) **66 hour(s) i 0 minuts** Workload structure: **234 hour(s) i 40 minuts (cources), 29 hour(s) i 20 minuts (preparation), 66 hour(s) i 0 minuts (additional work)**
Student obligations	Students are requested to attend lectures and exercises, to prepare practical work and to take colloquiums
Consultations	Every days when students have lectures according to schedule
Literature	1. General Pathophysiology, editor Milenko Kulauzov, Novi Sad,2015,Clinical Pathophysiology I and II part,editor Milenko Kulauzov, Novi Sad, 2015. Handbook of practical exercises and seminars of pathophysiology , editors Dujmović F., Stošić Z, Đerić
Examination methods	Chekup and assessment during the semester 50 points Final exam 50 points Student must have at least 51 points cumulatively to pass exam. Final exam at the end of II semester.
Special remarks	The students attend the lectures all together, for practical exercises they are devided into groups up to 10 students
Comment	-

Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points