

1. COURSE DESCRIPTION – GENERAL INFORMATION			
1.1. Course teacher	Professor Milan Kujundžić, MD, PhD Assistant Professor Ivica Grgurević, MD, PhD	1.6. Year of study	3 rd
1.2. Name of the course	Pathophysiology and pathology	1.7. Credit value (ECTS)	7.5
1.3. Associate teachers	Assistant Professor Mario Tadić, MD, PhD Joško Mitrović, MD, PhD Tomas Matić, MD Tomislav Bokun, MD	1.8. Type of instruction (number of hours L+E+S+e-learning)	60+0+30
1.4. Study programme (undergraduate, graduate, integrated)	Pharmacy integrated study programme	1.9. Expected enrolment in the course	130
1.5. Status of the course	Compulsory	1.10. Level of use of e-learning (1, 2, 3 level), percentage of instruction in the course on line (20% maximum)	2 nd
2. COURSE DESCRIPTION			
2.1. Course objectives	Objectives of the course are to enable students to identify, understand and explain the causes and pathophysiologic mechanisms of the development of diseases and its complications, including clinical manifestations, as well as expected alterations in laboratory findings. The aforementioned knowledge is the base for understanding of drug acting mechanisms, eventually allowing students to acquire wide understanding on functioning of human body in sanity and disease, as well as the possibilities for the diagnosis and treatment of diseases. Acquired knowledge during the course constitutes the background for the continuation of undergraduate education and understanding of pharmacology and pharmacotherapy.		
2.2. Enrolment requirements and required entry competences for the course	Undergraduate courses taken: i) Human physiology with anatomy, ii) Microbiology with parasitology. Knowledge in human physiology and anatomy. Experience in using text processing and presentation software (such as MS Office Package), as well as e-learning applications.		
2.3. Learning outcomes at the level of the study programme to which the course contributes	<ul style="list-style-type: none"> Evaluation of the clinical significance of biochemical and molecular/biological parameters. Interpretation of laboratory investigation results from the clinical aspect. 		

	<ul style="list-style-type: none"> • Development of positive interaction with patients, colleagues and other healthcare professionals through person-to-person and written communication.
2.4. Expected learning outcomes at the level of the course (4-10 learning outcomes)	<p>After passing the exam students will be able to:</p> <ol style="list-style-type: none"> 1. Explain pathophysiologic basics of diseases development; 2. Explain mechanism of inflammation, cell death, tumour development, as well as to distinguish between different variants of cell death, immunologic reactions and tumours; 3. Define and describe major aetiology factors in pathophysiologic processes; 4. Illustrate major pathophysiologic processes at the level of cell, organ, and in the human body as a whole; 5. Define, analyse and explain how a pathophysiologic event in one organ relates and influences to other organs and human body as a whole; 6. Illustrate major pathomorphologic changes in diseased tissues and organs; 7. Analyse alterations in laboratory findings; 8. By knowing pathophysiologic processes, to define possible targets for drug actions; 9. Apply acquired theoretical knowledge for the recognition of diseases and its aetiology factors.
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>LECTURES AND SEMINARS:</p> <ul style="list-style-type: none"> • Introduction to clinical pathophysiology. Cell death. Tumour genesis (I) • Tumour cachexia. Pathophysiology of pain. Gene regulation disorders (s) • Immune system. Inflammation. Autoimmune diseases (I) • Hypersensitivity reactions. Approach to patient with allergy (s) • Anaemia. Disorders of blood clotting (I) • Haematopoietic system. Leukaemia and lymphoma (s) • GI tract functions. GERD, gastritis and peptic ulcer disease. Inflammatory bowel disease (I) • Nausea and vomiting. Diarrhoea and constipation. Maldigestion and malabsorption (s) • Liver cirrhosis. Gallstone disease. Acute and chronic pancreatitis (I) • Liver failure. Portal hypertension. Viral hepatitis (s) • Heart and blood flow. Diseases of heart rate and rhythm. Valvular heart diseases (I) • Heart failure. Pulmonary hypertension (s) • Arterial hypertension. Coronary artery disease. Heart attack (I) • Diseases of pericardium. Shock. Diseases of arteries and veins (s) • Pathophysiology of infectious diseases. Sepsis. AIDS (I) • Problem solving of clinical scenarios (s) • Pathophysiology of endocrine system. Thyroid gland. Endocrine pancreas (I)

	<ul style="list-style-type: none">• Pathophysiology of the adrenal glands. Hypothalamus and hypophysis (s)• Diseases of bones. Rickets and osteomalacia (l)• Pathophysiology of diabetes mellitus. Hyperglycaemia, Hypoglycaemia. Hyperthyreosis. Hypothyreosis (s)• Disorders of renal functions. Acute and chronic renal failure. Hepatorenal syndrome (l)• Renal hypertension. Nephrotic syndrome. Nephrolithiasis (s)• Pathophysiology of respiration. Ventilation and perfusion. Restrictive and obstructive pulmonary diseases (l)• Acute and chronic respiratory insufficiency. Pulmonary oedema. Hypoxia and hyperoxia (s)• Pathophysiology of ionizing radiation. Noxiousness of chemicals. Noxious effects of physical and chemical factors on DNA (l)• Disorders of water and electrolytes. Acid-base disorders (s)• Disorders of consciousness. Cerebrovascular disease. Hydrocephalus (l)• Epilepsy. Neuromuscular diseases. Extraparal disorders (s)• Basics of pathology (l)• Problem solving of clinical scenarios (s)					
2.6. Type of instruction	lectures seminars and workshops exercises online in entirety mixed e-learning field work			independent study multimedia and the internet laboratory work with the mentor (other)		2.7. Comments:
2.8. Student responsibilities	Regular class attendance, active participation in seminars, active participation in solving of clinical scenarios.					
2.9. Screening of student's work (specify the proportion of ECTS credits for each activity)	Class attendance	2	Research		Practical training	1.5
	Experimental work		Report			
	Essay		Seminar essay	0.5	(Other--describe)	
	Tests		Oral exam		(Other—describe)	
	Written exam	3.5	Project		(Other—describe)	
2.10. Grading and evaluation of student work over the course of instruction and at a final exam	Partial exams and final written exam, seminar essay, active participation in solving of clinical scenarios.					
2.11. Required literature (available at the library and via other media)	Title					
	Kujundžić i suradnici: Klinička patofiziologija za studente Farmaceutsko-biokemijskog fakulteta. Zagreb, 2003. Kujundžić i sur.: Klinička patofiziologija za studente Farmaceutsko-biokemijskog fakulteta – u postupku izdavanja					
2.12. Optional literature	Kovač i suradnici: Klinička patofiziologija – etiopatogenetski čvorovi, 1.-4. dio, Medicinska naklada 2013.					
2.13. Methods of monitoring quality that ensure acquisition of exit competences	Expected learning outcomes 1 to 8 are being acquired through lectures and seminars, and are evaluated through written exam. Expected learning outcome No. 9 is being acquired by problem solving of clinical scenarios.					