

1. COURSE DESCRIPTION – GENERAL INFORMATION			
1.1. Course teacher	Prof. József Petrik, PhD Assoc. Prof. Roberta Petlevski, PhD	1.6. Year of study	3 rd
1.2. Name of the course	Clinical Biochemistry with Haematology	1.7. Credit value (ECTS)	6
1.3. Associate teachers	Professor Mirna Sučić, PhD Professor Renata Zadro, PhD Assist. professor Ksenija Fumić, PhD Marija Grdić Rajković, PhD Hulina Andrea, mag. med. biochem.	1.8. Type of instruction (number of hours L+E+S+e-learning)	35 + 30 + 10
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	Students will be introduced to the basics of chemical, biochemical and biological procedures aimed at analyzing the composition of biological fluids and tissues, and morphological characteristics of blood cells that determine changes during physiological and pathological processes in the human body.		
2.2 Enrolment requirements and required entry competences for the course	Prerequisite for admission: Pathophysiology with Pathology (completed course) and Biochemistry (passed exam)		
2.3. Learning outcomes at the level of the study programme to which the course contributes	<ul style="list-style-type: none"> • Monitoring the course and the outcome of therapy - identification of certain laboratory diagnosis tests, monitoring the course and the outcome of the treatment. • Application of perceptual and critical skills in the field of general clinical biochemistry and haematology aimed to develop and implement solutions to practical problems in production (basic tests and clinical trials of drugs), and 		

	monitoring the safe and proper use of medicinal products.
2.4. Expected learning outcomes at the level of the course (4-10 learning outcomes)	<p>After passing the course the student will / will be able to:</p> <ol style="list-style-type: none">1. Identify the basic principles of laboratory diagnostics in the field of general clinical biochemistry and haematology;2. Interpret the principles of common qualitative and quantitative methods for the determination of laboratory tests under physiological and pathophysiological conditions of the organism;3. Identify key tests in the field of general clinical biochemistry and haematology following functions of organs and systems of organs;4. Combine the principles of analytical interferences and biological effects of drugs with the results of laboratory tests;5. Identify the diagnostic possibilities of using molecular biological methods in the detection of pathological conditions;6. Explain methods of determining individual analytes in serum, urine and blood from the area of general clinical biochemistry and haematology;7. Perform basic laboratory determination of some analytes in serum, urine and blood.

<p>2.5. Course content broken down in detail by weekly class schedule (syllabus)</p>	<p>LECTURES:</p> <ul style="list-style-type: none"> • Basics of working in medical laboratory: current status and perspective of clinical biochemistry; Test materials, measures and units, techniques, instruments and automatization, control of work, methods of determination, reference intervals, analytical interferences and biologic effects of drugs. • Water, electrolytes and microelements: distribution and regulation of water and electrolytes in the body fluids, disorders, methods. • Acid-base balance: definitions and parameters of acid-base balance, mechanisms of acid-base balance disorders, methods of determination. • Qualitative and quantitative analysis of urine. • Proteins: serum proteins - formation, degradation, function, protein types - methods, disorders. • Nitrogen metabolites: methods of determination and disorders. Haemoglobin and metabolites: methods of determination and disorders. • Carbohydrates: hormone regulation and disorders in glucose metabolism, acute and chronic complications, methods of determination. • Lipids and lipoproteins: metabolism and hormonal regulation, methods of determination of lipid compounds and lipoproteins, congenital and acquired disorders. • Enzymes: serum enzymes, organ specific enzymes, isoenzymes, methods of determination of enzyme catalytic concentrations. • Introduction to Haematology: The function of erythrocytes, leukocytes and platelets, disorders and diseases of the red blood cells, granulocytes, monocytes, lymphocytes, and platelets. • Diagnostic possibilities of application of molecular biological methods in the detection of pathological conditions. <p>EXERCISE:</p> <ul style="list-style-type: none"> • Introductory seminar; alanine aminotransferase; aspartate aminotransferase. • Glucose; cholesterol; sodium; potassium. • Alkaline phosphatase. • Non-protein nitrogen compounds: urea, creatinine, bilirubin. • Proteins, serum protein electrophoresis. • Routine urine examination. Determination of calcium in blood serum. 		
<p>2.6.Type of instruction</p>	<p>lectures seminars and workshops exercises online in entirety mixed e-learning field work</p>	<p>independent study multimedia and the internet laboratory work with the mentor (other)</p>	<p>2.7.Comments:</p>
<p>2.8. Student responsibilities</p>	<p>Regular attendance of lectures, seminars and exercises.</p>		

2.9. Screening of student's work (specify the proportion of ECTS credits for each activity)	Class attendance	2.5	Research		Practical training	
	Experimental work		Report			
	Essay		Seminar essay	0.5	(Other--describe)	
	Tests	0.5	Oral exam		(Other—describe)	
	Written exam	2.5	Project		(Other—describe)	
2.10. Grading and evaluation of student work over the course of instruction and at a final exam	Teaching methods: lectures, exercise, seminars. Methods of evaluation and assessment of learning outcomes: written exam, entrance and final colloquium for practical classes.					
2.11. Required literature (available at the library and via other media)	Title					
	Juretić D, Lipovac K. Medicinska biokemija, II dopunjeno izdanje, Studij farmacije (internal script), Farmaceutsko-biokemijski fakultet, Zagreb, 2002. Lecture handouts Haematology (internal script) Laboratory exercises (internal script)					
2.12. Optional literature	Štrausova Medicinska biokemija – Medicinska naklada 2009. Labar B, Hauptmann E. i sur. Hematologija, Školska knjiga, Zagreb, 1998.					
2.13. Methods of monitoring quality that ensure acquisition of exit competences	Outcomes 1-5 are tested by written examination, the outcome 7 during exercises in the laboratory, while 6 and 7 are tested by the final colloquium for practical classes.					