

1. COURSE DESCRIPTION – GENERAL INFORMATION			
1.1 Course teacher	Assoc. Prof. Roberta Petlevski, PhD Prof. József Petrik, PhD	1.6. Year of study	3 <sup>rd</sup>
1.2. Name of the course	<b>General Clinical Biochemistry</b>	1.7. Credit value (ECTS)	13,5
1.3. Associate teachers	Associate Professor Dunja Rogić, PhD Anita Somborac Bačura, PhD Marija Grdić Rajković, PhD Andrea Hulina, mag. med. biochem.	1.8. Type of instruction (number of hours L+E+S+e-learning)	60+90+30
1.4. Study programme (undergraduate, graduate, integrated)	Integrated stud of Medical biochemistry	1.9. Expected enrolment in the course	20-25
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 <sup>nd</sup>
2. COURSE DESCRIPTION			
2.1. Course objectives	Introducing the students to analytical quality specification of methods used for the measurement of analytes in biological fluids, cells and tissues in order to assess the pathological changes in the human organism.		
2.2. Enrolment requirements and required entry competences for the course	Enrolment requirements for this subject: Biochemistry and Physiology and Human Anatomy courses completed Conditions for taking an examination in this subject: passed examination in Biochemistry and Physiology and Human Anatomy.		
2.3. Learning outcomes at the level of the study programme to which the course contributes	<ul style="list-style-type: none"> <li>• Applying expert knowledge and skills in making and analytical interpretation of laboratory tests</li> <li>• The implementation of quality control systems in such a way that the rules of good laboratory practice</li> <li>• Improving laboratory diagnostics in the field of general medical biochemistry.</li> </ul>		
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"> <li>1. Perform laboratory method for the determination of each analyte in a clinical specimen;</li> <li>2. To assess the clinical significance of certain biochemical parameters;</li> <li>3. Anticipate and avoid possible errors that can occur in preanalytical, analytical and postanalytical phase of laboratory work;</li> <li>4. Describe the biochemical mechanisms that alter the concentration of a particular analytes in the body;</li> <li>5. Explain the results of laboratory tests and associate them with certain pathological conditions;</li> </ol>		

	6. Identify the diagnostic possibilities of using molecular biological methods in the detection of pathological conditions.				
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>LECTURES AND SEMINARS:</p> <ul style="list-style-type: none"><li>Principles of medical biochemistry laboratory work: preanalytical, analytical and postanalytical phases, specimens, techniques and instrumentations, quality assurance, methods, reference intervals.</li><li>Water and electrolytes: water and electrolytes balance and regulations, fluid compartments, water, sodium, potassium, chloride, lithium, calcium, phosphates, magnesium, disturbances and disorders, methods of determination.</li><li>Acid-base balance and blood gases: definitions and diagnostic parameters of acid-base balance, buffer systems, kidney and lung as control systems, acid-base disturbances, methods of determination.</li><li>Proteins in body fluids: proteins in plasma and serum, urine, cerebrospinal fluid, transudates, exudates, metabolism and catabolism of proteins, individual plasma proteins, methods of determination, disorders. Non-protein nitrogen compounds: amino acids, urea, creatine, creatinine, urate, ammonium, disorders, methods of determination.</li><li>Carbohydrates: metabolism and hormonal regulation, diabetes mellitus, acute and chronic complications, hypoglycaemia, glycated haemoglobin, fructosamine, disorders in the metabolism of galactose, fructose and glycogen, methods of determination.</li><li>Lipids and lipoproteins: metabolism and hormonal regulation, structure and physiology of lipoproteins, apolipoproteins, triglycerides, cholesterol, phospholipids, disturbances, methods of determination.</li><li>Enzymes: serum enzymes, organ-specific enzymes, isoenzymes, methods of determination of enzyme catalytic concentrations, LDH, AST, ALT, ALP, GGT, CK, AP, amylase, lipase, principles of diagnostic enzymology.</li><li>Trace elements: iron, copper, zinc, selenium, characteristics of essential-trace element functions, disorders, methods of determination.</li><li>Urin: composition, formation of urine, excretion, filtration, measurement of GFR, reabsorption, qualitative and quantitative urin analysis, urin sediment, disorders, faeces and disorders.</li><li>Vitamins: solubility, health effects, deficiencies, methods of determination.</li><li>Hem synthesis: porphyrias, deficiency in the enzymes of the porphyrin pathway, sign and symptoms, diagnosis, methods of determination. Hemoglobin and hem disintegration: hemoglobin variants HbS, HbC, hemoglobinopathies, thalassemias, bilirubin metabolism, jaundice, methods of determination.</li></ul>				
2.6. Type of instruction	<u>lectures</u> <u>seminars</u> and workshops exercises online in entirety mixed e- learning field work	independent study multimedia and the internet <u>laboratory</u> work with the mentor (other)	2.7. Comments:		
2.8. Student responsibilities	Regular attendance of lectures, exercises and seminars.				
2.9. Screening of student's work (specify	Class attendance		Research		Practical training

the proportion of ECTS credits for each activity so that the total number of CTS credits is equal to the credit value of the course)	Experimental work		Report		(Other--describe)	
	Essay		Seminar essay	0.5	(Other--describe)	
	Tests		Oral exam	10.5	(Other--describe)	
	Written exam	3	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, oral exam, entrance and final colloquium for practical classes.					
2.11. Required literature (available at the library and via other media)	<b>Title</b>				<b>Number of copies at the library</b>	<b>Availability via other media</b>
	Štrausova Medicinska biokemija – editor: Medicinska naklada 2009.				18	
	Lecture handouts					Available on the website
	Laboratory exercises (internal script)					
2.12. Optional literature						
2.13. Methods of monitoring quality that ensure acquisition of exit competences	Outcomes 2 – 6 are tested by written and oral examination, the outcome 1 during exercises in the laboratory, while outcome 1 is tested by the final colloquium for practical classes.					