

1. COURSE DESCRIPTION – GENERAL INFORMATION			
1.1. Course teacher	Professor József Petrik, PhD	1.6. Year of study	3 rd
1.2. Name of the course	Clinical Biochemistry of Organs and Organ Systems 1	1.7. Credit value (ECTS)	4
1.3. Associate teachers	Associate Professor Nada Vrkić, PhD Associate Professor Zlata Flegar-Meštrić, PhD Associate Professor Dunja Rogić, PhD Željka Vogrinc, PhD	1.8. Type of instruction (number of hours L+E+S+e-learning)	30+0 +15
1.4. Study programme (undergraduate, graduate, integrated)	Integrated study of Medical biochemistry	1.9. Expected enrolment in the course	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 nd
2. COURSE DESCRIPTION			
2.1. Course objectives	Define laboratory tests in various biological materials and factors that may affect the results — from sample to findings during the pre-analytical, analytical and post-analytical phases. Explain the meaning of general and specific clinical-biochemical tests in the fields of screening, prevention, diagnostic, monitoring and prognosis and success in treating individual organs and organ systems.		
2.2. Enrolment requirements and required entry competences for the course	Prerequisites: General Clinical Biochemistry and Pathophysiology with Pathology (completed courses)		
2.3. Learning outcomes at the level of the study programme to which the course contributes	<ul style="list-style-type: none"> • Application of expert knowledge in laboratory diagnostics procedures (recognition of pre-analytical, analytical and post-analytical factors while determining the biochemical tests of serum, urine, cerebrospinal fluid, joint fluid and other biological materials). • Application of analytical and critical skills in developing and implementing solutions to practical problems in laboratory diagnostics (applied expertise in laboratory tests for screening, identifying, monitoring the disease, effects of therapy and prognosis in malignant tumours and other pathologies related to diagnostics in special 		

	<p>biological materials), etc., identifying laboratory tests for the study of certain pathological conditions, or for clinical trials of drugs.</p> <ul style="list-style-type: none"> • Critical Evaluation and application of scientific knowledge and data available to solve problems. • Applying specific expertise and skills in communication in the health care team.
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. Explain the principles of taking and using of cerebrospinal fluid, joint fluid, transudates, exudates and other biological materials for laboratory diagnostics in the field of specialized clinical biochemistry; 2. Interpret and explain the mechanisms that may affect the results of laboratory testing in the pre-analytical, analytical and post-analytical phases; 3. Connect the principles of analytical interferences and biological effects of drugs and possible changes in laboratory test results; 4. Explain the process of creating reference values for different populations; 5. Describe the functioning principles of analytical analysers, laboratory information system and hospital information systems; 6. Explain the laboratory tests, the application of analyser and clinical point of care; 7. Describe methods for determination of individual tests in serum, urine and blood, cerebrospinal fluid, joint fluid, etc., in the area of special clinical biochemistry.
2.5. Course content broken down in detail by weekly class schedule (syllabus)	<p>LECTURES AND SEMINARS:</p> <ul style="list-style-type: none"> • Laboratory analysis of organ specific biological material (exudates, transudates, joint fluid, cerebrospinal fluid, amniotic fluid, saliva and other biological fluids). • Osmometry; dehydration and hyper-hydration of organism. • Diagnostic significance of tumour markers (incidence of malignant tumours, the most prevalent cancer in Croatia, stages of the tumour development, carcinogenic factors, characteristics of malignant tumour cells, metabolic changes in malignant cells, a division of malignant tumours of the genesis, classification of tumours, clinical application of tumour markers, molecular genetics in oncology, diagnostic sensitivity of the test, diagnostic specificity of the test, the clinical use of tumour markers, oncofetal protein, carbohydrate antigens, enzymes, hormones and hormone receptors, surface antigens, genetic markers, recommendations for use of tumour markers in specific cancers, the level of evidence and strength of recommendations for classification of tumour markers and tumour markers for cancers: breast, ovary, cervix, prostate, lung, liver, stomach, colon, and other cancers). • Cerebrospinal fluid diagnosis; Biochemical and cytological examinations of cerebrospinal fluid.

	<ul style="list-style-type: none">• The effect of haemolysis, lipemia and icterus on the results of laboratory tests.• The causes of <i>in vivo</i> and <i>in vitro</i> haemolysis.• Analytical interferences and biologic effects of drugs on the results of laboratory tests.• Biological variation.• Methods of evaluation of laboratory results.• The criteria for selection of the reference person; development and implementation of reference values for specific laboratory tests; reference range for healthy population.• Interpretation of results of laboratory tests.• Automation on and computerization in the laboratory; Types of automation.• Biochemistry, immunochemistry and haematology analyzers.• Laboratory diagnosis during the intensive care; point of care testing. Types of point of care instruments, types of care testing and the realm of rational diagnosis.					
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	Teaching methods: lectures and seminars. Methods of evaluation and assessment of learning outcomes: written and oral exam.					
2.9. Screening of student's work (specify 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)	Class attendance	1	Research		Practical training	
	Experimental work		Report			
	Essay		Seminar essay	0.5	(Other--describe)	
	Tests		Oral exam	1.5	(Other—describe)	
	Written exam	1	Project		(Other—describe)	
2.10. Grading and evaluation of student work over the course of instruction and at a final exam	Attendance at lectures and seminar sessions, written and oral exams.					
2.11. Required literature (available at the library and via other media)	Title					
	Štrausova Medicinska biokemija – Medicinska naklada 2009.					
	Čepelak I. i sur. Medicinsko-biokemijske smjernice, Medicinska naklada, Zagreb 2004.					
	Lecture handouts.					
2.12. Optional literature	Teitz Textbook of Clinical Chemistry and Molecular Diagnostics, 4 th Edition. CA Burtis, ER Ashwood & DE Bruns, Eds. Elsevier Saunders & Co., St. Louis, USA, 2006.					
2.13. Methods of monitoring quality that ensure acquisition of exit	Passed written exam or four partial assessments (at least 60% from each) and oral exam.					

competences	
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