1. COURSE DECRIPTION – GENERAL INFORMATION			
1.1. Course teacher	Associate Professor Nada Vrkić, PhD	1.6. Year of study	4th
1.2. Name of the course	**Clinical Biochemistry of Organs and Organic systems 2**	1.7. Credit value (ECTS)	6
1.3. Associate teachers	Professor József Petrik, PhD Associate Professor Roberta Petlevski, PhD Associate Professor Ana-Maria Šimundić, PhD Professor Slavica Dodig, PhD Mario Štefanović, PhD Ivanka Mihaljević, PhD Marija Grdović Rajković,PhD Andrea Hulina, mag. med. biochem.	1.8. Type of instruction (number of hours L+E+S+e-learning)	30+30+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)	2nd
2. COURSE DESCRIPTION			
2.1. Course objectives	Student will acquire fundamental knowledge necessary to understand pathogenesis and pathophysiology of disorders in liver, kidney, heart, blood vessels, gastrointestinal, respiratory and bone tissue. Recognize significance of biochemical markers in diagnosis, prognosis and monitoring of the therapy. Define the role of medical-biochemical laboratory in the monitoring outcome of blood dialysis and transplantation and biochemical approach to the haematological diseases. Relate results of laboratory analyses with pathophysiology of the disease. Distinguish specific biochemical changes related to pregnancy that are not result of pathological changes. Student will be able to review different diagnostic procedures and evaluate and select analytical methods with appropriate specificity and selectivity. Practical exercises performed in clinics will provide necessary relation to the professional work.		
2.2. Enrolment requirements and required entry competences for the course	Enrolment requirements: completed study course Clinical Biochemistry of Organs and Organic systems 1, and knowledge acquired in courses in General Clinical Biochemistry, Pathophysiology and Pathology and Biochemistry		

2.3. Learning outcomes at the level of the study programme to which the course contributes	• Translation of the professional knowledge on diseases into laboratory diagnostic procedures (relating knowledge on pathogenesis and pathophysiology mechanisms to diagnostic biomarkers, application of specific and common diagnostic tests to successful differential diagnostics • Application of analytical and expert competences into development and implementation of solutions for everyday problems in laboratory diagnostics (clinical interpretation of particular diagnostic tests and group of tests for distinct disorders and diseases, establishing clinical reliability, specificity and selectivity of particular diagnostic tests, knowledge on data processing and introducing information technology into laboratory practice) • Decisive evaluation and application of scientific data for problem solving and application of professional skills and competences into communication within the health care providing team
2.4. Expected learning outcomes at the level of the course (4-10 learning outcomes)	After completion of course student will be able to: 1. Explain pathophysiological origins for the diseases of liver, heart, kidney and gastrointestinal tract; 2. Describe and outline types of biological samples and diagnostic algorithms for diagnosis and monitoring of the therapy in the related diseases; 3. Relate test results to clinical symptoms, and recognize critical values for each test; 4. Select appropriate methods for specific diagnostics of organs and type of biological specimen; 5. Evaluate principles of laboratory methods and reliability of test results; 6. Depict the role of medical biochemists in interpretation of diagnostic tests and collaboration with other relevant medical staff in upgrading quality of pre-analytical phase; 7. Describe physiological changes related to pregnancy and influence to the biochemical and haematological tests; 8. Explain principles and application of automation and laboratory informatics system.
2.5. Course content broken down in detail by weekly class schedule (syllabus)	LECTURES AND SEMINARS: • Laboratory diagnostics of the liver diseases, serologic diagnostics of hepatitis. • Laboratory diagnostics of alcoholism. • Laboratory diagnostics of the kidney diseases and proteinuria. • Laboratory monitoring of the success in haemodialysis and transplantation. • Mechanism of pathogenesis of atherosclerosis; biomarkers for risk assessment and development of the disease. • Comorbidities connected with atherosclerosis. • Dyslipidaemias: genetic and acquired, risk factors for development of atherosclerosis, metabolic syndrome, and cardiovascular risk.

	• Laboratory diagnostics of the heart diseases, laboratory diagnostics of stroke. • Laboratory diagnostics of the pulmonary diseases. • Clinical biochemistry of diabetes. • Laboratory diagnostics of the diseases of gastrointestinal tract. • Laboratory diagnostics of the diseases of bone tissue. • Laboratory diagnostics of the nutritive status in the patients on enteral and parenteral nutrition. • Biochemical implications of the haematological diseases. • Biochemical changes in normal pregnancy and interpretation of laboratory results that are outside reference range for general population but are pregnancy related.

2.6. Type of instruction		2.7. Comments:
	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)	Seminars and laboratory practicals are related and synchronised with the lecture subjects, discussion of papers related to lecture subjects, problem solving approach, interpretation of the laboratory results, analysing reliability of laboratory results in differential diagnosis, proposing diagnosis based on the laboratory results, demonstration of the automation and application of informatics in clinical laboratory

2.8. Student responsibilities	

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	0.5	Research		Practical training	
	Experimental work		Report			
	Essay		Seminar essay	1.5	(Other--describe)	
	Tests		Oral exam	3.0	(Other—describe)	
	Written exam	1.0	Project		(Other—describe)	

2.10. Grading and evaluation of student work over the course of instruction and at a final exam	

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.		
	Burtis CA., Ashwood ER. Tietz Fundamentals of Clinical Chemistry, 4 izdanje, WB Saunders Company, A Harcourt Health Sciences Company, London, Philadelphia, 2001		

	Power Point Presentations		
2.12. Optional literature	Thomas L. Clinical laboratory diagnostics. Use and assessment of clinical laboratory results, Th-Books Verlagsgesellschaft mbH, Frankfurt/Main 1998.		
2.13. Methods of monitoring quality that ensure acquisition of exit competences	Successfully completed written exam (alternative 4 partial tests with minimum 60% knowledge) and oral examination.		