

Study program : Chemistry			
Type and level of studies: Master studies of chemistry			
Course unit: Biochemistry 2 with enzymology			
Teacher in charge : Milan Mladenović, PhD, Assistant Professor			
Language of instruction : English			
ECTS: 15			
Prerequisites: Entered first year of master studies of chemistry			
Semester: Winter semester			
Course unit objective			
Student will be introduced with the biochemical reactions of certain organs in humans by applying knowledge of basic biochemistry course. Introduction to the physiological organization of certain organs, biochemical composition and biochemical reactions. Enzymes as the basis for the functioning of living systems. Structural and physiological organization of enzymes. The application of acquired knowledge in further enzyme research..			
Learning outcomes of Course unit			
Biochemical organization of organs, anabolic and catabolic reactions of primary and secondary molecules in a complex biological system. Metabolic pathways of transport and transformation of different compounds. Enzymes as bioindicators of development of metabolic reactions and functions of organs.			
Course unit contents			
<i>Theoretical classes.</i> Resorption mechanism of nutrient substances. Digestion reactions of primary molecules. Biochemical organization and liver function. Determination of functional liver parameters. Biochemistry of blood. Qualitative, quantitative and enzymatic methods for determining blood parameters. Biochemical organization and kidney function. Determination of enzyme parameters of kidney function. Energetic metabolism. The metabolism of cations and anions. Methods for quantitative determination of biochemically important cations and anions. Biochemical reactions of detoxication of organism.			
<i>Experimental classes:</i> Determination of succinate dehydrogenase activity in mitochondrial fraction. Determination of superoxide dismutase activity. Interaction of hemoglobin with oxygen. Determination of free amino acids in serum. Determination of alanine transaminase and aspartate transaminase activity. Determination of clinically important metabolites in blood (glucose, proteins, cholesterol, phospholipids, triacylglycerols...). Determination of prothrombin time in blood plasma. Isolation of DNA. Examination of kinetics of the enzymatic reaction. Examination of enzyme activity. Application of enzymes in medicine and food industry.			
Literature			
<ol style="list-style-type: none"> 1. R. K. Murray, D. K. Granner, P. A. Mayes, V. W. Rodwell, <i>Harper's Illustrated Biochemistry</i>, 26ed, McGraw-Hill Co., 2003 2. D. L. Nelson, M. M. Cox, <i>Leninger PRINCIPLES OF BIOCHEMISTRY</i>, 4ed, W. H. Freeman Publishers, 2012 3. R. H. Garret, C. H. Grisham, <i>BIOCHEMISTRY</i>, Cengage Learning, 2012 4. J. M. Berg, J. L. Tymoczko, L. Stryer, <i>Biochemistry</i>, 5ed, Inbunden, 2011 5. Voet & Voet, <i>Biochemistry</i>, 4ed, John Wiley & Sons, 2004 6. J. Koolman, K. Roehm, <i>Color Atlas of Biochemistry</i>, 2ed. Thieme, 2003 			
Number of active teaching hours			Other classes
Lectures: 2	Practice: 2	Other forms of classes: <i>mentoring system</i>	Independent work:
Teaching methods			
Lectures, seminars, practical classes			
Examination methods (maximum 100 points)			
Exam prerequisites	No. of points:	Final exam	No. of points:
Student's activity during lectures	10	oral examination	
practical classes/tests	20	written examination	50
Seminars/homework	20	
Project			
Other			

Grading system		
Grade	No. of points	Description
10	90-100	Excellent
9	80-90	Exceptionally good
8	70-80	Very good
7	60-70	Good
6	50-60	Passing
5	<50	Failing