

Level: Undergraduate Vocational Studies in Optometry				
Course title: Biochemistry				
Status: obligatory				
ECTS: 6				
Requirements: none				
Learning objectives To familiarize students with basic concepts in biochemistry necessary for understanding the other biochemistry-related courses.				
Learning outcomes After completion of the course, the student is able to: (1) describe structure and chemical properties of the main classes of biomolecules and their role in organism, (2) explain the relationship between three-dimensional structure of biological macromolecules and their biological function, (3) demonstrate the basic knowledge of enzyme catalysis mechanisms, importance of enzymes for living systems, and kinetics and thermodynamics of enzyme-catalyzed reactions, (4) explain the function of the main metabolic processes in cell, and the conversion of nutrients into metabolic fuel.				
Syllabus <i>Theoretical instruction</i> Molecular logic of life. Amino acids, peptides, proteins. Protein structure levels. Carbohydrates: structure, classification, function. Lipids structure and function. Biological membranes, membrane transport. Fat-soluble vitamins, biochemical basis of vision. Nucleotides and polynucleotides (DNA, RNA). Enzymes: concepts, basics of enzyme catalysis. Co-enzymes, water-soluble vitamins. Introduction to metabolism. Catabolism and anabolism. Bioenergetics, phosphate group transfer. Main pathways of energy metabolism: glycolysis, gluconeogenesis, glycogenolysis, glycogenesis, fatty acids oxidation, Krebs cycle, electron-transport chain and oxidative phosphorylation. <i>Practical instruction</i> Specific tests and methods for quantitative determination of amino acids, proteins, carbohydrates and lipids. Experimental determination of enzyme kinetics parameters. Monitoring of glycolysis, alcoholic fermentation and Krebs cycle.				
Weekly teaching load				Other:-
Lectures: 3	Exercises: 1	Other forms of teaching:3	Student research: -	