

Level: bachelor			
Course title: Introduction to Biochemistry I, B-202			
Status: obligatory			
ECTS: 5			
Requirements: none			
Learning objectives This is an introductory course focused on basic concepts in biochemistry needed to pursue further courses and research in the field of biochemistry, and will provide students with knowledge of: (1) the vocabulary and fundamental facts about four major classes of biomolecules (proteins, carbohydrates, lipids, and nucleic acids), (2) the chemical properties and three-dimensional structure of biomolecules and their relationship to their biological function. (3) Developing students' practical skills and abilities to apply the standard experimental methods for the analysis of biological material.			
Learning outcomes Upon completion of the course, students will be able to: (1) demonstrate knowledge of basic elements of the structure of biomolecules, from simple molecules to complex macromolecular and supramolecular structures, (2) use biochemical vocabulary, (3) describe the structure and chemical properties of carbohydrates, proteins, lipids, and nucleotides and their functions in the body, and show examples of how the three-dimensional structure of macromolecules determines their biological function, (4) browse biochemical literature (books, journals and Internet resources) and independently write simple text to the selected topic in the field of biochemistry, (5) to use chemical and biochemical methods in solving practical problems in biochemistry and interpret the obtained experimental results.			
Syllabus <i>Theoretical instruction:</i> Biochemistry and evolution, the cell as the basic unit of life. Basic thermodynamic principles of biochemical reactions. Intermolecular interactions; inter- and intra-cellular buffers. Basic cellular biomolecules: proteins and polynucleotides. Amino acids and primary structure of the proteins. Peptide bond and its properties. Three-dimensional structure of proteins. Types of bonds that stabilize structure of the protein. Allosteric regulation, hemoglobin as an allosteric protein. Nucleotides. Coenzymes. Classification and distribution of coenzymes. Carbohydrates, classification, properties and functions. Polysaccharides: structural and storage polysaccharides. Glycosaminoglycans. Glycoproteins. Peptidoglycan framework in bacterial cell walls. Glycoproteins. N- and O-glycoproteins. Lipids – classification, structural and functional properties. Acilglycerols, phospholipids, sphingolipids, and glycolipids. Isoprenoids, steroids, steroid hormones and eicosanoids and their functions. <i>Practical instruction:</i> Laboratory work follows theoretical instruction.			
Weekly teaching load			Other:
Lectures: 2	Exercises: 2	Other forms of teaching: /	