

Study Program: Biology				
Type and level of studies: Bachelor studies				
Course name: Biochemistry				
Lecturer: Trajković Lj. Radmila				
Status: Compulsory				
ECTS: 7				
Attendance Prerequisites:				
Course aims Introducing students to the basic structure of biomolecules, physicochemical structure of the cell and tissue, as well as the numerous chemical processes occurring within the organism during which an incessant exchange of matter and energy occurs.				
Course outcome The acquired knowledge enables students to understand the ways of including biomolecules in metabolic processes, as well as to understand the mechanisms of biochemical reactions and enzymatic activity in the regulation of metabolic process. The acquired knowledge represents a basis for understanding courses that rely on biochemical research.				
Course content				
<i>Theoretical part</i> Definition, tasks, methods and the relationship of biochemistry with other sciences; historical development. Cellular biochemistry. The structure and organisation of the cell and its organelles. Biochemistry of living organisms: amino acids, nucleic acid proteins, carbohydrates, fats. Enzyme biochemistry, energy, activation energy, compounds with high phosphate group transfer potential, respiratory chain and oxidative phosphorylation. Metabolism- the transfer of energy and matter. Metabolising carbohydrates- glycolysis and Krebs cycle. Carbohydrate synthesis (anabolism). Metabolising fats- beta-oxidation of fatty acids, oxidation of fatty acids with an odd number of carbon atoms. Fatty acid synthesis, protein metabolism—catabolism of amino acids, urea synthesis (Ornithine cycle), anabolism of essential amino acids, synthesis of the polypeptide chain. The regulating substances of organisms, vitamins and hormones. General properties and classifications.				
<i>Practical part</i> Performing practical exercises in laboratory conditions using modern methods. Adsorption, dialysis, reduction tests of carbohydrates, lipids, extractions, hydrolysis, physicochemical properties of fatty acids. Proteins; reversible and irreversible precipitation reactions, colour reactions of proteins, hydrolysis of simple and of complex proteins and detection of reaction products, enzymes: hydrolysis of starch by salivary amylase, the effect of temperature, NaCl and CuSO on amylase activity, proving the hydrolytic properties of pepsin and lipolytic activity of lipase, digestion and carbohydrate metabolism: extraction of glycogen from the liver and its analysis, protein digestion: way of denatured proteins persistence under the influence of HCl, showing the effect of pepsin from gastric mucosal extract, detecting vitamins: A, D, C, B, hormones: diazo reaction to adrenaline and the protein nature of insulin, isolation and detection of RNA from rat liver. Practical exercises follow the content of of theoretical classes.				
Literature				
<ol style="list-style-type: none"> 1. Момчило В. Михаиловић (2000) Биохемија ИТП „Научна“, Београд. 2. Цамић, М. (1998): Биохемија, научна књига Београд. 3. Величковић, Д.(1998): Основи биохемије за студенте биотехничких факултета, Београд. 4. Јапунџић, И., Ракић, Јб.(1995): Практикум из биохемије, научна књига Београд. Број часова активне наставе 0 				
Number of active classes				Other classes
Lectures: 3	Practical classes: 3	Other forms of teaching:	Students' research work	
Teaching methods Lectures, calculation exercises, laboratory exercises, consulting, term papers, homework, written exam.				
Assessment (maximum 100 points)				
Course assignments	points	Final exam		points
activity during lectures	10	written exam		20
practical classes	20	oral exam		50
term test(s)			
seminar(s)				
Total	30			70