

**Thematic lesson plan of lectures
in the discipline "Biochemistry, biochemistry of the oral cavity"
for students of the educational program
specialist in the specialty 31.05.03 Dentistry,
direction (profile) Dentistry,
form of study full-time
for the 2024-2025 academic year**

№	Topics of lectures	Hours (academic)
	2 term	
1.	Subject of biochemistry. Structural organization and physicochemical properties of proteins. Conformational changes in the structure of protein.	2
2.	Enzymes. Mechanism of enzymatic catalysis. Cofactors and coenzymes. Regulation of enzyme activity by covalent modification. Proteolytic modification. Allosteric regulation.	2
3	Biological oxidation. Mitochondrial electron transport chain. ATPase. Regulation of oxidative phosphorylation. The common path of catabolism.	2
4	Carbohydrates. Digestion and absorption of food carbohydrates. Glycogen synthesis and degradation. Regulation of glucose storage and mobilization.	2
5	Carbohydrate metabolism. Anaerobic and aerobic glycolysis. Gluconeogenesis. Pentose phosphate pathway. Hormonal regulation of carbohydrate metabolism.	2
6	Lipids. Classification. Digestion and absorption of food lipids. Transport of lipids blood. Lipoproteins. Fat storage and mobilization in adipose tissue.	2
7	Lipid metabolism. Oxidative degradation and biosynthesis of fatty acids. Oxidation of glycerol. Biosynthesis of triacylglycerol. Cholesterol exchange.	2
8	Biological membranes. Membrane lipids and proteins. Mechanisms for transmembrane transport of substances. Mechanisms for transmitting hormonal signals to cells.	2
9	Amino acids. The ways of formation and degradation of free amino acids in the human body. Direct and indirect deamination. Types of direct deamination. Synthesis and breakdown of glutamine.	2

	Transamination of amino acids.	
	3 term	
10	Individual transformations of amino acids. Synthesis of nonessential amino acids. Decarboxylation of amino acids. Biogenic amines: histamine, serotonin, γ -aminobutyric acid. Deamination and hydroxylation of biogenic amines. Amino acids as sources of carbon and nitrogen in the synthesis of mononucleotides.	2
11	Matrix biosynthesis. Nucleic acids are carriers of genetic information. Relationship between structure and function. Replication, repair and recombination of DNA. RNA transcription and processing. Translation and post-translational protein modification.	2
12	The main systems of intercellular communication. Classification of hormones. Target cells and cellular hormone receptors.	2
13	Regulation of energy metabolism. The role of insulin and contra insular hormones in homeostasis. Changes in hormonal status and metabolism in diabetes mellitus. The role of hormones in the regulation of calcium and phosphate metabolism (parathyroid hormone, calcitonin and calcitriol).	2
14	Biochemistry of connective tissue. Cellular composition. Intercellular matrix. Structure and functions of connective tissue.	2
15	Biochemistry of bone tissue. Cellular composition. Mineral composition of bone tissue. Bone proteins. Bone tissue remodeling.	2
16	Biochemistry of the tooth. Types of tooth tissues. Organic and mineral phases of tooth tissues. Biochemistry of the oral fluid. Physicochemical properties of saliva. Saliva proteins. Enzymes of saliva. Inorganic substances of saliva. Protective systems of saliva.	2
	Total	32

Considered at the meeting of the department of "17" _june_ 2024, protocol No 11

Head of the Department

O.V. Ostrovskiy