Confirmed by the Chair session
Protocol No. 7 dated «5» January 2023
The Head of the department_____ Prof. L. Kobylinska

THEMATIC SCHEDULE
of practice and laboratory studies on biological chemistry for the 2nd year students of medical faculty during the spring term of 2022 – 2023 academic year

No	The topic	Number of hours	Dates
Thematic module 6. **Metabolism of nitrogen nous bases, nucleotides. General regularities of matrix syntheses in living organisms and their regulation.**			
1.	Investigation of the metabolism of purine and pyrimidine nucleotides. Measurements of the end products of their metabolism. Hereditary disorders of their turnover.	2	30.01-3.02
2.	Investigation of DNA replication and transcription of RNA. Analysis of mechanisms of mutations, DNA reparations. Acquisition of the principles of obtaining recombinant DNA, transgenic proteins.	2	6.02-10.02
3.	Biosynthesis of protein in ribosomes. Investigation of initiation, elongation and termination processes in the synthesis of the polypeptide chain. The inhibitory effect of antibiotics. Mastering the principles of genetic engineering and cloning of genes, their application in modern medicine.	2	13.02-17.02
Thematic module 7. "Biochemistry of intercellular communications. Biochemistry of the endocrine system"			
4.	Investigation of molecular and cellular mechanisms of action of proteins-peptide nature hormones on target cells. Mechanism of action of hormones – derivatives of amino acids and biogenic amines. Hormonal regulation of calcium homeostasis.	2	20.02-24.02
5.	Investigation of molecular and cellular mechanisms of action of steroid and thyroid hormones on target cells.	2	27.02-3.03
Thematic module 8. "Biochemistry of blood"			
6.	Investigation of intermediate products of biosynthesis of porphyrins and their accumulation in porphyrias. Structure and properties of hemoglobin and its derivatives. Pathological forms of hemoglobin.	2	6.03-10.03
7.	Investigation of blood plasma proteins: acute phase inflammation proteins, plasma functional and plasma non-functional enzymes. Investigation of non-protein nitrogen-containing and nitrogen free components of blood.	2	13.03-17.03
8.	Investigation of coagulation, anticoagulation and fibrinolytic blood systems.	2	20.03-24.03
9.	Investigation of biochemical basics of the implementation of immune processes. Immunodeficiency states.	2	27.03-31.03
Thematic module 9. **"Biochemistry of tissues, organs and physiological processes"**			
10.	Study of the turnover of end products of catabolism of hem. Pathobiology of jaundice.	2	3.04-7.04
11.	Investigation of processes of biotransformation of xenobiotics and endogenous metabolites. Microsomal oxidation, cytochrome P-450.	2	10.04-14.04
12.	Study of water-salt and mineral metabolism.	2	17.04-21.04
13.	Urinary function of the kidneys. Normal and pathological components of urine.	2	24.04-28.04
14.	Investigation of the nervous system. Pathobiology of mental disorders.	2	1.05-5.05
15.	Peculiarities of metabolism in muscular tissue. Biochemical disorders in miopathias and myocardial infarction.	2	8.05-12.05
16.	Investigation of the biochemical components of the connective tissue.	2	15.05-18.05
	Totally:	**32**	

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THEMATIC SCHEDULE OF LECTURES
on biological chemistry for the 2nd year students of medical faculty
during the spring term of 2022 – 2023 academic year

No	Topics and contents of lectures	Lecturer	1-5 gr	6-11 gr	*Hours*
Thematic module 6. **Metabolism of nitrogen nous bases, nucleotides. General regularities of matrix syntheses in living organisms and their regulation.**					
1.	Metabolism of nucleotides in norm and pathology. General characteristics of matrix syntheses and their regulation. Molecular mechanisms of mutations	Prof. I. Fomenko	2.02	9.02	***2***
Thematic module 7. "Biochemistry of intercellular communications. Biochemistry of the endocrine system"					
2.	Hormones. Structure and classification of hormones. Membrane-cytosolic and cytosolic mechanisms of action of hormones. Regulation of metabolism by the protein-peptide, steroid and thyroid hormones	Prof. L. Kobylinska	16.02	23.02	***2***
Thematic module 8. "Biochemistry of blood"					
3.	Biochemistry of blood. Hemoglobin, its structure, properties, types, derivatives, biological role. Pathobiochemistry of blood. General characteristics of coagulation and fibrinolytic blood systems	Prof. I. Fomenko	2.03	9.03	***2***
Thematic module 9. "Biochemistry of tissues, organs and physiological processes"					
4.	Biochemical functions of the liver. Catabolism of heme, biochemistry of jaundice; biotransformation of endogenous substances and xenobiotics in the liver	Prof. L. Kobylinska	16.04	23.04	***2***
Totally:					***8***

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THEMATIC SCHEDULE of individual work on biological chemistry for the 2nd year students of medical faculty during the spring term of 2022 – 2023 academic year

No	The topic	Number of hours	Forms of assessment
Thematic module 6. Metabolism of nitrogen nous bases, nucleotides. General regularities of matrix syntheses in living organisms and their regulation.			
1.	Phases of the cell cycle of eukaryotes. Biochemical mechanisms of control of cell entry to mitosis; cdc2 -kinase, cyclin.	2	The current control during practice classes activities
2.	Biochemical mechanism of development of apoptosis and necrosis	2	
3.	Regulation of gene expression in prokaryotes (repression and induction). Structure of Lac-operon of *Escherichia coli*	2	
4.	Mutations: genomic, chromosomal, gene (point mutations), their significance in appearance of enzymopatias and human hereditary diseases.	2	
5	Congenital and acquired disorders of mechanisms of DNA repair	2	
6.	Genetic engineering. Cloning The application of genetic engineering techniques in modern medicine	2	
Thematic module 7. "Biochemistry of intercellular communications. Biochemistry of the endocrine system."			
5.	Endocrine function of the pancreas in nor and in pathology	2	The current control during practice classes activities
6.	Metabolism of arachidonic acid in a human body and the influence of its products on biochemical processes.	3	
7.	Biogenic amines with hormonal and neurotransmitter properties. Receptors of biogenic amines.	3	
Thematic module 8. "Biochemistry of blood"			
10.	Acid-base equilibrium of blood. Regulation of pH in biological fluids, disorders of acid-base equilibrium.	4	The current control during practice classes activities
11.	Main types of hypoxias, mechanisms of their development, methods of diagnostics	4	
12.	Glycoproteins: their structure, biological role, changes in diseases.	2	
13.	AIDS and COVID-19, molecular mechanism of occurrence, pathochemical changes.	4	
***Thematic module 9.* "Biochemistry of tissues, organs and physiological processes"**			
14.	Changes in biochemical indicators in chronic hepatitis, cirrhosis, gallstone disease, dyskinesia and cholecystitis, their diagnostic evaluation.	5	The current control during practice classes activities
15.	Reactions of microsomal oxidation and conjugation in the biotransformation of xenobiotics and endogenous toxins	4	
16.	Human microelementoses.	4	
17.	Biochemical mechanisms of urine production (filtration, reabsorption, secretion and excretion).	2	
18.	Causes and mechanisms of renal stones formation, chemical composition of renal stones and preventive measures.	2	
19.	Molecular mechanisms of muscular contraction: modern data on interaction of muscular filaments.	2	

20.	Biochemical changes of blood plasma enzymes in different periods of myocardial infarction and other heart diseases. Heart damage and biochemical diagnosis in thyrotoxicosis, hypothyroidism, hypercorticism, diabetes, parathyroid gland disease, radiation exposure, porphyria, gout, nutritional disorders, alcoholic heart damage	2	
21	Heart damage and biochemical diagnosis in thyrotoxicosis, hypothyroidism, hypercorticism, diabetes, parathyroid gland disease, radiation exposure, porphyria, gout, nutritional disorders, alcoholic heart damage	2	
22	Pathobiochemistry of connective tissue. Biochemical mechanisms of development of mucopolysaccharidoses and collagenoses, their biochemical diagnostics.	4	
	Totally	**65**	