APPROVED
at the Chair meeting of 25.08.25, minute no.1,
Head of the Biochemistry and Clinical Biochemistry Chair,
MD, profssor, Tagadiuc Olga _____

PLAN OF THE THEORETICAL AND PRACTICAL CLASSES
IN BIOCHEMISTRY, FACULTY MEDICINE II, FIRST YEAR, SPRING BATCH, 2025-2026 ACADEMIC YEAR, FALL SEMESTER

Fall semester (2) – first year			
N	**Data**	**Theoretical classes**	**Practical lessons**
1	01-05.09.25	Lipids: structure, properties. Biologic role of lipids. Digestion and absorption of lipids. Disorders of digestion and absorption of lipids. Re-synthesis of lipids in the intestinal epithelium. Triglyceride metabolism.	The biological role of lipids. Digestion and absorption of lipids. Lipid re-synthesis. Transport of dietary lipids (chylomicrons) Metabolism of reserve lipids. Oxidation of glycerol. *Determination of bile acids*.
2	08-12.09.25	Metabolism of fatty acids and ketone bodies.	Metabolism of fatty acids. Beta-oxidation and biosynthesis of fatty acids. Biosynthesis and use of ketone bodies. *Determination of ketone bodies.*
3	15-19.09.25	Metabolism of structural lipids: biosynthesis and catabolism of cholesterol, phosphoglycerides, sphingolipids. Tissue lipidosis.	Metabolism of structural lipids: biosynthesis and catabolism of cholesterol, phospholipids, sphingolipids. Tissue lipidosis. Notions relating to the blood transport of lipids. Plasma lipoproteins: structure, separation methods, fractions (chylomicrons, VLDL, LDL and HDL), chemical composition (lipids and apoproteins), functions. *Dosage of cholesterol. Determination of beta-lipoproteins.*
4	22-26.09.25	Plasma lipoproteins: structure, methods of separation, fractions (chylomicrons, VLDL, LDL, HDL); chemical composition (lipids and apoproteins). Regulation of lipid metabolism.	**Concluding test 1: “Lipid Metabolism”**
5	29.09-03.10.25	Metabolism of simple proteins. The dynamic state of proteins. The nitrogen balance. Digestion and absorption of proteins. Decarboxylation of the amino acids.	Metabolism of simple proteins. Digestion and absorption of proteins. Putrefaction of amino acids in the intestine. General pathways of amino acid metabolism: deamination, transamination. *Gastric juice acidity assay*.
6	06-10.10.25	General ways of amino acid metabolism: deamination,	Fate of the carbon skeletons of amino acids. Biosynthesis of non-

		transamination. The final products of nitrogen metabolism. Ammonia detoxification. Ureagenesis.	essential amino acids. Mechanisms of ammonia detoxification. Urea synthesis. Hyperammonemia and uremia (causes, clinical manifestations, treatment principles). *Dosage of urea in urine.*
7	13-17.10.25	Peculiarities of the metabolism of some amino acids.	Decarboxylation of amino acids (reactions, enzymes, coenzymes). Biosynthesis of histamine, serotonin, dopamine, γ-aminobutyric acid, their biological role. Neutralization of biogenic amines. Tetrahydrofolic acid. Its role in the synthesis of serine, methionine, glycine, purine and pyrimidine nucleotides. Megaloblastic anemia. Metabolism (biosynthesis, metabolic role, catabolism) of methionine, cysteine, glycine, serine, arginine, tryptophan, dicarboxylic amino acids (Asp, Glu), asparagine, glutamine, phenylalanine and tyrosine. The role of these amino acids in the synthesis of other compounds. *Homogentisic acid assay in urine*.
8	20-24.10.25	Metabolism of purine nucleotides. Metabolism of pyrimidine nucleotides. Metabolism of chromoproteins	Metabolism of purine and pyrimidine nucleotides. Metabolism of chromoproteins. Biosynthesis of hemoglobin: location, substrates, equations of the first two reactions, regulation of the process. Porphyrias (general concepts). Catabolism of hemoglobin. Bilirubin: formation, conjugation, biliary excretion, its metabolism in the intestine. Hyperbilirubinemias. Main types of jaundice (prehepatic, hepatic and posthepatic). *Total and direct bilirubin assay in blood serum*. *Uric acid assay in urine.*
9	27-31.10.25	Genetic regulation. Replication. Transcription. Induction. Repression.	**Concluding test on chapter "Metabolism of simple and conjugated proteins”**
10	03-07.11.25	Biochemical bases of translation. Protein post-translational changes.	DNA replication in prokaryotes – mold, substrates, enzymes and protein factors. Biochemical mechanism and stages of DNA biosynthesis. Inhibitors of replication – the mechanism of action and the biomedical role (acyclovir, foscarnet, doxorubicin). Biochemical mechanisms of DNA repair. Enzymes involved. Biochemical mechanisms and role mutations. Pathologies caused by mutations

			(falciform anemia, phenylketonuria). Transcription to prokaryotes: substrates, enzymes, biochemical mechanism. Transcription inhibitors (rifampicin, nalidixic acid, α-amanitin). Peculiarities of replication and transcription in eukaryotes. Post-transcription changes of mRNA. *Quantitative determination of DNA. Quantitative determination of RNA.*
11	10-14.11.25	Hormones, structure, biological role, classification. Regulation of hormone synthesis and secretion. Mechanisms of action	Protein biosynthesis in prokaryotes. Stages of protein biosynthesis regulation in prokaryotes and eukaryotes. Translation inhibitors (tetracycline, chloramphenicol, erythromycin, streptomycin, diphtheria toxin). The medical role. Polymorphism of proteins (variants of hemoglobin, blood groups). Biochemical bases of hereditary pathologies. Biochemical methods of diagnosis. *Determination of total blood-serum proteins (biuretic method).*
12	17-21.11.25	Protein, peptide hormones and amino acid derivatives: metabolic effects.	Hormones – structure, classification and biological role. Regulation of hormone synthesis and secretion. Mechanisms of action. Protein peptide hormones and amino acid derivatives: metabolic effects. *Adrenaline identification reactions*
13	24-28.11.25	Hormones of steroid and thyroid nature (T_3 and T_4).	Cytosolic - nuclear mechanism of hormones action of steroid and thyroid nature (T_3 and T_4). Effects of hormones: glucocorticoids; sexual; thyroid (T_3 and T_4). Vitamins A and D: structure, properties; metabolic role; hypo- and hypervitaminosis (causes, metabolic and clinical manifestations). Eicosanoids. Classification, general notions of structure, synthesis, mechanism of action, effects. *Reaction of identification of 17-ketosteroids in the urine. Dosage of calcium in blood serum.*
14	01-05.12.25	Vitamins A and D. Eicosanoids.	**Concluding test on chapter "Genetic and hormonal regulation of metabolism"**
15	08-12.12.25		**Evaluation of students individual work**

Note: Svetlana Bobcova, PhD, associate professor, is responsible for the theoretical classes at the Faculty of Medicine nr 2, spring batch.
Duration of the theoretical class - 2 hours, practical lesson - 3 hours.