APPROVED
at the Chair meeting of 15.01.25, minute no.7,
Head of the Biochemistry and Clinical Biochemistry Chair,
MD., professor, Olga Tagadiuc _____

PLAN OF THE THEORETICAL AND PRACTICAL CLASSES
IN CLINICAL BIOCHEMISTRY, FACULTY MEDICINE II, THIRD YEAR,
2024-2025 ACADEMIC YEAR, SPRING SEMESTER

Spring semester (6th), third year				
N	**Data**	**Theoretical classes**	**Lecturer**	**Practical lessons**
1	03-07.02	Clinical laboratory diagnosis	O. Tagadiuc	Laboratory clinical diagnosis: purpose, objects of analysis and stages. Factors that influence the results of the analyses: a) internal factors (associated with the patient) – age, sex, race, physiological state; b) external factors – collection time, food, smoking, stress, medications. The pre-analytical, analytical and post-analytical stage of clinical laboratory diagnosis. Clinical value of results – reference values. Interpretation of results. The causes of errors at different stages of clinical laboratory diagnosis and how to prevent them.
2	10-14.02	Blood biochemistry. Proteins, enzymes and non-protein nitrogenous compounds. Basic concepts in the interpretation of pathological variations in serum enzymes.	E. Pavlovschi	Functions of plasma proteins. Characteristics of the main plasma proteins. Protein dosing and separation methods. Serum proteinogram. Pathological changes of plasma proteins. Acute phase proteins of inflammation. Proteins - tumor markers. Plasma enzymes. Serum enzymes in liver, heart, GI, muscle, bone, kidney diseases. The value of enzymes in malignant diseases. Nitrogenous non-protein compounds of the blood plasma. Residual nitrogen. Its fractions in norm and pathology. Mechanisms of water retention and production of azotemia.
3	17-21.02	Haemostasis	T. Timercan	Notions of haemostasis. Its role and stages. Primary haemostasis and its exploration. Secondary haemostasis and coagulation exploration; genetic abnormalities of changes in coagulation factors. Anticoagulant mechanisms. Fibrinolysis. Notes on anticoagulant and antiplatelet therapy
4	24-28.02	Hydro-electrolytic and acid-base	P. Globa	Pathochemistry of quantitative and qualitative disturbances of water and

		balance		electrolyte homeostasis. Control of water, sodium and potassium homeostasis. Disorders of water, sodium and potassium metabolism. Diagnosis of hydro-electrolytic disorders and the pathochemical principles of treatment. Physiological and biochemical mechanisms of acid-base balance regulation. Parameters of acid-base balance, their physiological and pathological variations (age, time of day, phases of digestion, state of exertion). Metabolic and respiratory acidosis and alkalosis.
5	03-07.03	Pathochemistry and laboratory exploration of renal pathology	C. Lazăr	Renal functions. Glomerular filtration: pathochemistry, exploration and interpretation of laboratory results. Tubular functions: pathochemistry and exploration. Proteinuria: causes, laboratory differentiation. Pathochemistry of nephrological syndromes: renal tubular acidosis, Alport syndrome; nephrotic syndrome; nephritic syndrome; acute renal failure (ARI) and chronic (CRI); diabetic, toxic and medicinal nephropathy. Diagnosis of renal dysfunctions. The pathogenetic principles of treatment of renal dysfunctions.
6	10-14.03	Biochemistry of bone tissue. Calcium and phosphate homeostasis	V. Sardari	Bone – composition, remodeling. Calcium and phosphate metabolism. Mechanisms involved in homeostasis and their disorders. Biochemical markers of bone metabolism. Metabolic bone diseases. Osteoporosis, osteomalacia. Paget's disease, bone metastases, primary hyperparathyroidism, secondary hypoparathyroidism.
7	17-21.03	Laboratory investigation of plasma lipids and lipoproteins. Primary and secondary dyslipidemias	T. Timercan	**Concluding test 1**
8	24-28.03	Disorders and explorations of carbohydrate metabolism	F. Darii	Plasma lipoproteins – structure, role, separation methods. Apoproteins, proteins, enzymes and receptors involved in lipoprotein metabolism. Laboratory investigation of plasma lipids and lipoproteins. Factors that can influence lipid parameters. Primary and secondary dyslipidemias. Biochemical principles of treatment of hyperlipidemias. Atherosclerosis. The role of lipoproteins in atherosclerosis. Atherogenic dyslipidemia.
9	31.03-04.04	Pathochemistry of the thyroid gland	E. Pavlovschi	The role of the endocrine pancreas and hormonal control in maintaining glucose homeostasis. Postprandial and interprandial blood glucose regulation. Pathochemistry of physiological and pathological changes in blood glucose:

				hypoglycemia: investigation algorithm for hypoglycemia in adults; hyperglycemia. Diabetes mellitus: definition and classification of diabetes mellitus, pathogenic mechanisms, screening and diagnosis of diabetes mellitus. Pathochemistry of complications of diabetes mellitus. Metabolic syndrome. Etiopathogenesis and pathophysiology of metabolic syndrome: screening, diagnosis, evaluation.
10	07-11.04	Steroid hormones (adrenal and sex) – biochemical aspects and laboratory investigations	F. Darii	Peculiarities of the metabolism of thyroid hormones (T_3 and T_4). Paraclinical thyroid examination: evaluation of the functional state of the thyroid gland; thyroid autoimmunity tests; special serum markers; biochemical constants in serum; radioiodine uptake (RIC); dynamic exploration; imaging exploration of the thyroid – correlations with laboratory biochemical methods (generalities). The investigation algorithm of thyroid function. Hyperthyroidism and Hypothyroidism: definition; paraclinical diagnosis of hypothyroidism; principles of treatment.
11	14-18.04	Pathochemistry and diagnosis of hepatobiliary diseases	O. Tagadiuc	Adrenal cortical pathology: causes and pathogenic mechanisms, metabolic disorders and laboratory diagnosis. Sex hormones - structure, biosynthesis, regulation of secretion (ovarian cycle), transport, metabolism, actions, disorders and their evaluation.
12	28.04-02.05	Pathochemistry and diagnosis of hepatobiliary diseases	O. Tagadiuc	Liver biochemistry. Methods for investigating the integrative role of the liver and markers of metabolic disorders in liver diseases, of bile excretion and markers of diagnostic interest, of hepatotoxicity. Biochemical syndromes specific to liver diseases. Laboratory markers of each syndrome and their diagnostic value. Markers of cancerous liver diseases.
13	05-09.05	Biochemistry of nerve transmission	C. Lazăr	Peculiarities of the chemical and metabolic composition of nerve cells. The structure of synapses and the peculiarities of communication between nerve cells. The structure and classification of neurotransmitters. Cholinergic, monoaminergic, aminoacidergic, peptidergic, purinergic neurotransmitters. Synthesis, storage, release of neurotransmitters, removal of mediators from the synaptic cleft, synaptic receptors, biochemical mechanisms of action of neurotransmitters at the postsynaptic level. Pathologies associated with disorders in the synthesis, release or action of various neurotransmitters, or damage to their receptors (Parkinson's disease, Alzheimer's

				disease, schizophrenia, depression, anxiety, migraine, myasthenia gravis, epilepsy).
14	12-16.05	Students individual work – presentation of the most interesting reports		**Concluding test 2**
15	19-23.05	Students individual work – presentation of the most interesting reports		**Evaluation of students individual work**

Note: The course is taught entirely in English for third-year students of Faculty of Medicine nr2 by the team of authors:
Tagadiuc Olga, MD, professor;
Timercan Tatiana, PhD, associate professor;
GLoba Pavel, PhD, associate professor;
Pavlovschi Ecaterina, PhD, associate professor;
Lazăr Cornelia, PhD, associate professor;
Sardari Veronica, PhD;
Darii Felicia.
Duration of the theoretical class - 2 hours, practical lesson - 2 hours.