

**Thematic plan of seminar-type classes
in discipline «Clinical Biochemistry»
for students of 2024 year of admission
under the educational programme
31.05.01 General Medicine,
profile General Medicine,
(Specialist's degree),
form of study full-time
for the 2025-2026 academic year**

№	Thematic blocks	Hours (academic)
3rd semester		
1.	Introduction to the discipline. Quality control and standardization of laboratory research. Part 1 ¹ . Fundamentals of health care, organization of laboratory services. Meaning, goals, objectives and place of clinical biochemistry in medicine. Preanalytical stage of laboratory diagnostics. ²	2
2.	Introduction to the discipline. Quality control and standardization of laboratory research. Part 2 ¹ . Organization of quality control of laboratory research. Means and methods of quality control. External quality assessment. Basic statistical criteria. Research standardization. Reference values and average. Screening, preventive and differential diagnostic studies. Express diagnostics. Basic CI units in biochemistry. ²	2
3.	Biochemical studies in liver diseases. Part 1 ¹ . Clinical and biochemical syndromes. Enzymodiagnosics of liver diseases. ²	2
4.	Biochemical studies in liver diseases. Part 2 ¹ . Types of jaundice. Hyperbilirubinemia and bilirubinuria. The formation of bilirubin and its fractions in the blood, liver, intestines, kidneys. Jaundice of newborns. Reference values, differential diagnosis of liver diseases. ²	2
5.	Blood plasma proteins, functions. Types of proteinograms. ¹ Synthesis of proteins in the liver, RES, cells of the immune system. Determination of total protein content in blood and urine. Characterization of protein fractions. Proteins of the acute phase of inflammation. Types of proteinograms. ²	2
6.	Control of knowledge, skills, skills in thematic blocks (modules) «Introduction to the discipline of clinical biochemistry. Quality control and standardization of laboratory research. Biochemical studies in liver diseases. Blood plasma proteins». ¹	2
7.	Biochemical diagnosis of pancreatic diseases. Diabetes mellitus. Part 1 ¹ . Biochemical diagnosis of diseases of the pancreas. Enzyme activity in duodenal juice. Pancreatitis, diagnostic value of determining the activity of α -amylase in the blood and urine. Activity of trypsin, α 1-proteinase inhibitor, α 2-macroglobulin in the blood. ²	2
8.	Biochemical diagnosis of pancreatic diseases. Diabetes mellitus. Part 2 ¹ . Diabetes mellitus. Diagnostic criteria for type 1 and type 2 diabetes. Impaired fasting glycemia, impaired glucose tolerance, postprandial hyperglycemia. Methods for determining the content of glucose. Early diagnosis of diabetes mellitus. Compensation criteria and vascular risk assessment. ²	2

9.	Biochemical diagnosis of diseases of the cardiovascular system. Part 1 ¹ . Diseases of the cardiovascular system. atherosclerosis, stages of development. Lipid metabolism disorders. Diagnostic value of determining the content of cholesterol and its fractions in the composition of blood lipoproteins. Hypercholesterolemia. Key indicators of atherosclerosis. ²	2
10.	Biochemical diagnosis of diseases of the cardiovascular system. Part 2 ¹ . Differential diagnosis of heart diseases, enzyme constellations. Enzymatic diagnosis of myocardial infarction. Non-enzymatic markers of myocardial infarction. Laboratory diagnosis of heart failure. ²	2
11.	Laboratory diagnosis of kidney diseases. ¹ Main kidney diseases. Filtration, reabsorption, secretion. Clinical and biochemical analysis of urine. Clearance, transport maximum, renal threshold, functional indicators of kidney function. Diuresis and its disorders. Physiological components of urine. Methods for their determination. Pathological components of urine. ²	2
12.	Control of knowledge, skills, skills in thematic blocks (modules) «Laboratory diagnosis of diseases of the pancreas, diabetes, diseases of the cardiovascular system, kidneys». ¹	2
13.	Laboratory diagnostics of water and electrolyte balance disorders. ¹ Positive and negative water balance of the body. Edema, mechanism development. Hyper- and hyponatremia, its types and mechanisms of development. Hormonal regulation of sodium excretion by the kidneys. The role of potassium ions in muscle contraction, maintaining the functions of the cardiovascular system, kidneys. Hyper- and hypokalemia, clinical manifestations. Hyper- and hypocalcemia, hyper- and hypophosphatemia in children and adults. Methods for determining indicators of mineral metabolism. ²	2
14.	Laboratory diagnostics of acid-base balance disorders in the body. Emergency conditions in anesthesiology and resuscitation, general clinical tests, express diagnostics. Part 1 ¹ . The mechanism of the hemoglobin buffer system. Physiological systems: the role of the lungs, kidneys, liver in maintaining acid-base balance. Forms of violation of the acid-base balance. Clinical and diagnostic significance of changes in indicators of acid-base balance. ²	2
15.	Laboratory diagnostics of acid-base balance disorders in the body. Emergency conditions in anesthesiology and resuscitation, general clinical tests, express diagnostics. Part 2 ¹ . Emergency conditions in anesthesiology and resuscitation, general clinical tests, express diagnostics. ²	2
16.	Control of knowledge, skills, skills in thematic blocks (modules) «Laboratory diagnostics of water-electrolyte balance and acid-base balance disorders». ¹	2
	Total	32

¹ – topic

² – essential content

³ – one thematic block includes several classes, the duration of one class is 45 minutes, with a break between classes of at least 5 minutes

Considered at the department meeting of Clinical Laboratory Diagnostics
protocol of «30» May 2025. № 14.

Head of the Departmen  B.V. Zavodovsky