Working curriculum of the discipline "Chemistry"
Educational program 6B10115 -"Medicine"

1.	General information about the discipline		
1.1	Discipline code: Him 1202	1.6	Academic year: 2025-2026
1.2	Name of the discipline:Chemistry	1.7	Course: 1
1.3	Prerequisites: subjects of secondary general education: chemistryI, biologyI, physicsa and mathematics.	1.8	Semester: 1
1.4	Post-requirements: medical бbiochemistry, morphology and physiology.	1.9	Number of Credits (ECTS): 4
1.5	Cycle: BD	1.10	Component: UC

2.	Description of the discipline (maximum 50 words)
Formation of fundamental knowledge about chemical processes in the human body, types of concentrations for determining the quantitative content of substances in biological fluids and preparation of medical solutions, the biological role of organic compounds used in medicine. Basic principles of qualitative and quantitative analysis for the diagnosis and treatment of diseases	

3.	Summative assessment form *		
3.1	Testing ✓	3.5	Coursework
3.2	Written	3.6	Essay
3.3	Oral survey	3.7	Project
3.4	OSPE/OCE or the reception of practical skills ✓	3.8	Other (specify)

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4.	Objectives of the discipline
Formation of students' holistic physico-chemical, natural science approach to the study of the human body and its environment, as well as substantiation of chemical and physico-chemical aspects of the most important biochemical processes and various types of equilibria occurring in a living organism.	

5.	Final learning outcomes (RO disciplines)
LO1	-demonstrates knowledge **of** chemical processes (basic types of reactions) in the body that obey general laws and laws of chemistry, as well as general energy and kinetic laws of chemical processes; - demonstrates knowledge of the classification, properties and applications in medicine of the main classes of organic compounds.
LO2	-understands and applies knowledge of calculation formulas (mass fraction, molar concentration, molar equivalent concentration, molal concentration, molar fraction, titer) in the preparation of solutions of specified concentrations and understands how to determine the quantitative content of substances in the studied systems, including biological fluids.
LO3	--develops general theoretical foundations of chemistry, knowledge of various types of chemical reaction equilibria and life processes; mechanisms of action of buffer systems of the body, their interrelation and role in maintaining acid-base homeostasis for knowledge, skills and abilities in their subsequent professional activities; -demonstrates knowledge about the role of biogenic elements and their compounds in living systems physical and chemical bases of surface phenomena; features of adsorption at different phase separation boundaries; physical and chemical properties of dispersed systems and biopolymer solutions.
LO4	-ddemonstrates knowledge of the relationship between the chemical properties of organic compounds and their biological activity.

LO5	-zexplains the basics of heterocyclic compounds as a basis for creating medicines and features of acid-base properties of amino acids and proteins and their role in maintaining acid-base homeostasis.	
LO6	Uses learning skills to publicly present their own judgments, analysis and synthesis of information in the field of chemistry applications in medicine.	
LO7	-sfollows the principles of academic integrity and behavior in teaching when performing written papers, answering exams.	
5.1	**LO disciplines**	**Learning outcomes of the OP, which are associated with RO disciplines**
	LO 1	RO1 Applies fundamental knowledge of biomedical, clinical, epidemiological, and social-behavioral sciences to practice.
	LO 2	
	LO 3	
	LO 4	RO11 Analyzes the effectiveness of diagnosis and treatment results, applying the principles of personalized medicine.
	LO 5	
	LO 6	
	LO 7	

6.	**Detailed information about the discipline**					
6.1	Venue (building, auditorium): South Kazakhstan Medical Academy, main building, Department of Chemical Disciplines. Al-Farabi-1, 5th floor, Chemistry classes are held in the SKMA laboratory classrooms, which are equipped with specialized laboratory instruments and equipment, instrument and computer systems. Laboratory and practical classes are held in 517, 521, 523, 528, 530 training rooms of the department. Phone (PBX) 40-82-06.					
6.2	Number of hours	Lectures	Practice	Laboratory	SIW	SIWT
		8	32	-	12	68(12)

7.	**Information about teachers**		
№	Full name	Degrees and positions	Email address
1	Daurenbekov Kanat Narbekovich	Head of the Department, Candidate of Chemical Sciences, acting professor.	daurenbekov.kanat@mail.ru
2	Dildabekova Lazzat Anarkulovna	Candidate of Pedagogical Sciences, Acting Associate Professor	Lazzat_D@inbox.ru

8. Thematic plan

A week	**Topic name**	**Summary of Content**	**LO disci-plines**	**Num-ber of hours**	**Forms/ metods/ tech-noloies of learing**	**Forms/ methods of evalua-tion**
1	***Lecture No. 1. Topic.*** Introduction. Thermodynamics of biological processes. Basic concepts and	The subject and tasks of chemistry. Chemical thermodynamics is the theoretical basis for the study of metabolism and energy. The	LO 1	1	overview	Feedback

	laws of thermodynamics.	human cell as a complex thermodynamic system. Thermochemistry. Hess's law. Entropy. Gibbs energy.				
	Practical lesson No. 1. Topic: Fundamentals of chemical thermodynamics and its importance in medicine.	Thermodynamics of biological processes. Bioenergetics. System. The concept of enthalpy. Hess's law. Enthalpy changes in various chemical and physico-chemical processes. The second law of thermodynamics. Entropy. Gibbs free energy. Thermodynamics of living systems. Exoergonic and endoergonic processes occurring in the human body. Safety instructions in the laboratory and compliance with workplace regulations. Types of chemical utensils and reagents.	LO 1	2	Small group work, laboratory work	Oral interview/ problem solving
	SIW			-/3		
2	***Lecture No.2. Topic:*** Chemical kinetics and enzymatic catalysis.	Chemical kinetics and its significance in medicine Kinetics of chemical reactions. Factors affecting the reaction rate. Forecasting the shift of chemical equilibrium. Concepts of the kinetics of biological processes in living organisms. Enzymatic catalysis. The nature and classification of enzymes. Features of the action of enzymes in living organisms. The importance of enzymes in the metabolic processes of vital activity.	LO 1	1	overview	Feedback
	Practical lesson No.2. Topic: Chemical kinetics and its importance in medicine.	Kinetics of chemical reactions. Factors affecting the reaction rate. Forecasting the shift of chemical equilibrium. Concepts of the kinetics of biological processes in living organisms.	LO 1	2	Small group work, laboratory work	Oral interview/ problem solving, protection of the result of laboratory experiments
	SIWT No. 1/SIW. SIW assignment No. 1.1 Enzymatic catalysis. Features of the action	Enzymatic catalysis. The nature and classification of enzymes. Features of the action of enzymes in living organisms. The importance of enzymes in	LO 1 LO 6	1/4	presentation	Oral interview

	of enzymes. Protective enzymes of the body. ***SIW assignment No. 1.2*** Water. Chemical reactions in an aqueous solution. The biological role of water in a living organism.	the metabolic processes of vital activity. Water, the structure of the molecule. Properties of water. Distilled, non-pyrogenic water. The importance of water for the vital activity of organisms.				
3	***Practical lesson No. 3. Topic:*** Solutions. Colligative properties of solutions. The role of osmosis in biological processes.	Concentration of solutions and methods of their expression. Preparation of physiological solutions. The importance of solutions in the vital activity of organisms. Osmosis in blood cells. The Van't Hoff law. Plasmolysis, hemolysis, turgor and isotonicity. Classification of solutions for injection (hypotonic, hypertonic and isotonic solutions).	LO 2 LO 3	2	working in small groups, lab. work	Oral interview, problem solving, protection of laboratory results
	SIWT No. 2/SIW. SIW assignment No. 2.1 The importance of solutions in the vital activity of organisms. Electrolytes in a living organism. ***SIW assignment No.2.2*** The biological role of coordination compounds. Biocomplexes. Understanding of the structure of metalloenzymes (hemoglobin, chlorophyll) and their biological role	Types of solutions. Solubility. The dependence of solubility on temperature. Electrolytes. Strong and weak electrolytes. The degree of dissociation and concentration of ions in solutions of weak electrolytes. Biological body fluids in the form of solutions of electrolytes and non-electrolytes. The biological role of coordination compounds in the human body. Representations and biocomplexes. The structure of hemoglobin, chlorophyll, vitamin B12 (cyanocobalamin) and their biological role.	LO 2 LO 6	1/4	presentation	Oral interview
4	***Lecture No.3. Topic:*** Buffer systems. The importance of buffer systems in the human body.	Buffer systems. Biological functions of buffer systems in living organisms. Buffer zone, its calculation. Determination of the pH of acidic and basic buffer	LO 3	1	overview	Feedback

		systems. The importance of buffer systems in the human body				
	Practical lesson No. 4. Topic: Buffer systems. The importance of buffer systems for maintaining a constant acid-base balance in the body.	Acid-base balance in the processes of vital activity of Buffer systems. Buffer zone, its calculation. Determination of the pH of acidic and basic buffer systems. The importance of buffer systems in the human body	LO 3	2	working in small groups, lab. work	problem solving, protection of laboratory results
	SIWT No. 3/SIW. SIW assignment No. 3.1 Disturbance of the acid-base balance in the body. Homeostasis. ***SIW assignment No. 3.2*** Chromatography and its application in medical practice.	Acid-base state of the body. Types of acidosis and alkalosis. The main types of homeostasis. Mechanisms of homeostasis. Violations of the acid balance of the blood. Chromatography in medicine: classification, application, prospects. Determination of medicinal and narcotic substances.	LO 3 LO 6	1/3	presentation	Oral interview
5	***Lecture No. 4. Topic:*** Colloidal-dispersed system. Properties of dispersed systems. Stability and coagulation of colloidal solutions.	Concepts: dispersed system, dispersed phase, dispersion medium. Classification of dispersed systems. The structure of the micelle. Methods of obtaining and purifying colloidal solutions. Optical and electrokinetic properties of colloidal solutions. The Tyndall effect. Coagulation, its medical and biological significance. The Schulze-Hardy rule. Dialysis, electroosmosis and electrophoresis in medical practice.	LO 3	1	overview	Feedback
	Practical lesson No. 5 Topic: Colloidal-dispersed system. Properties of dispersed systems. Stability and coagulation of colloidal solutions.	Concepts: dispersed system, dispersed phase, dispersion medium. Classification of dispersed systems. The structure of the micelle. Methods of obtaining and purifying colloidal solutions. Dialysis in medical practice. Optical and electrokinetic properties of colloidal solutions. Electroosmosis and electrophoresis, their application	LO 3	2	working in small groups, lab. work	Oral interview, problem solving, protection of laboratory results

		in medicine. The Tyndall effect. Coagulation, its medical and biological significance. The Schulze-Hardy rule.				
	SIW			-/4		
6	***Practical lesson No. 6 Topic:*** Biogenic s-, p-, and d-elements and their significance for living organisms.	Classification of chemical elements. The arrangement of s-, p-, and d-elements in the periodic table. The content of chemical elements in the body. The biological role of chemical elements in the vital activity of a living organism.	LO 3	2	working in small groups, lab. work	problem solving, protection of laboratory results
	SIWT No. 4/SIW. SIW assignment No. 4.1 Biogenic and toxic elements of the human body. ***SIW Assignment No. 4.2*** Surface phenomena at the interface of phases. Biological significance of adsorption processes. Adsorption therapy.	Biogenic elements are non-metals that make up the human body. Biogenic elements are metals that make up the human body. Endemic diseases associated with a lack and excess of elements in water and food. The influence of environmental aspects, food and bad habits on the condition of the whole organism. Surface energy and surface tension. The concept of sorption, adsorption, and absorption. Adsorption at the interface of phases, factors influencing adsorption. Surfactants and surfactants. The Duclos-Traube rule.	LO 3 LO 6	1/4	presentation	Oral interview
7	***Lecture No. 5. Topic:*** Biologically important heterofunctional organic compounds.	Amino alcohols. Hydroxy and oxoacids. Structure, nomenclature, reactivity, and biological role.	LO 4	1	overview	Feedback
	Practical lesson No. 7 Topic: Redox processes and their biological role. Electrode potentials.	Redox reactions. Electrode potentials. Galvanic cells. Electromotive force (EMF) of a galvanic cell. The Nernst equation. The direction of redox processes. Membrane potential. The importance of redox reactions in human life.	LO 1	2	working in small groups	oral interview, problem solving
	SIWT No. 5/SIW.	Potentiometry. The use of potentiometry methods in clinical analysis and in the	LO 1 LO 6	1/4	presentation	Oral interview

	SIW assignment No. 5 Potentiometry in medical practice.	practice of sanitary and hygienic research. Determination of the concentration of physiologically active ions in biological fluids and tissues using potentiometric methods.				
8	***Lecture No. 6. Topic:*** Amino acids. Peptides, proteins.	α-Amino acids. The structure and classification of α-amino acids, which are part of proteins. Stereoisomerism. Chemical properties of amino acids. Specific reactions of α, β, γ-amino acids. Acid-base properties of α-amino acids. Peptides, proteins. The structure of the peptide group. The primary structure of peptides and proteins. Proteins and their functions in living systems.	LO 4 LO 5	1	overview	Feedback
	Practical lesson No. 8. Topic: Acidity and basicity of organic compounds. Reactivity and biological functions of alcohols, phenols, thiols and amines.	The theories of Broensted Lowry and Lewis. Types of organic acids (OH-, SH-, NH- and CH-acids) and bases (n- and π-bases).Factors determining acidity and basicity: electronegativity and polarizability of the atom of acidic and basic centers, electronic effects of substituents, solvation effect. Reactivity of alcohols, phenols, thiols and amines	LO 1 LO 4	2	working in small groups	oral interview and test control
	SIWT No.6/SIW Consultation on the implementation of **Midterm No. 1**	Control of the assimilation of theoretical knowledge and practical skills on the topics of lectures, practical exercises and SIW (1-7 topics).	LO 7	1/4	Oral and written ticket test	Oral and written test
9	***Practical lesson No. 9. Subject:*** Oxo-connections. Aldehydes and ketones. Reactions of nucleophilic addition and condensation. Carboxylic and dicarboxylic acids. Reactions of nucleophilic substitution.	Aldehydes and ketones. The general formula. Isomerism. Nomenclature (trivial, rational, and systematic). Chemical properties. Aldehydes and ketones, their biological functions. Carboxylic and dicarboxylic acids. General characteristics. Methods of obtaining. Chemical properties. Biological significance of mono- and dicarboxylic acids	LO 4	2	working in small groups	Oral interview/ test control
	SIW			-/4		

10	***Lecture No. 7. Topic:*** Carbohydrates and their biological significance	Carbohydrates. Monosaccharaides. Structure and stereoisomerism. Chemical properties of monosaccharides. Oligo and polysaccharides. The structure and biological role of oligo- and polysaccharides. The biological role of carbohydrates in living cells of the body.	LO 4	1	overview	Feedback
	Practical lesson No. 10. Topic: Heterofunctional compounds involved in vital processes	Hydroxy acids. Classification and nomenclature. Physical and chemical properties. α, β- and γ-hydroxy acids.Lactides. Lactones. Oxyacids. Classification and nomenclature. Methods of preparation and properties. Keto-enol tautomerism. Reactions of ketone and enol forms of acetoacetic ether. The most important representatives of hydroxy and oxoacids. Heterofunctional compounds as the basis of biologically active substances of the body and medicines.	LO 4 LO 5	2	working in small groups, lab.work	Oral interview/ test control, protection of laboratory results
	SIWT No. 7/SIW. SIW assignment No. 7.1 Heterofunctional benzene derivatives as medicinal products. ***SIW assignment No. 7.2*** Spatial structure of organic compounds. The mutual influence of atoms in organic molecules.	p-Aminophenol, salicylic acid, p-aminobenzoic acid, sulfanylic acid and their derivatives. Nomenclature, structure, production methods and chemical properties. Practical application, importance in medicine. Configuration and conformation are the most important concepts of stereochemistry. Methods of depicting the spatial structure of molecules. Stereochemical nomenclature. Chirality in organic chemistry. Enantiomers. Diastereomers. Racemates.	LO 4 LO 6	1/3	Presentation	Oral interview
11	***Lecture No. 8. Topic:*** Biologically important heterocyclic compounds. Nucleic acids. DNA and RNA.	The importance of biologically important five- and six-membered heterocyclic compounds with one and two heteroatoms in medicine and pharmacy. Reactivity and acid-base properties of five- and six-membered heterocyclic.	LO 5	1	overview	Feedback

		Nucleosides. The nucleotides. The structure of nucleic acids. Biological functions of DNA and RNA. Nucleotide coenzymes. Nucleoside polyphosphates in biochemical processes.				
	Practical lesson No. 11. Topic: α-Amino acids and their chemical properties. Peptides. Squirrels.	Amino acids. Classification and nomenclature. Methods of receipt. Chemical properties. Chemical properties of α-, β- and γ- amino acids. Concepts of proteins. Composition, structure, and physico-chemical properties of proteins. Qualitative identification and quantitative determination of proteins and individual amino acids. Levels of structural organization of protein molecules. Classification of proteins. Simple and complex proteins. Structural proteins. Biological functions of proteins.	LO 4	2	working in small groups, lab.work	Oral interview/ test control, protection of laboratory results
	SIWT No. 8/SIW. SIW assignment No. 8.1 Essential Amino Acids for humans. ***SIW assignment No. 8.2*** Antibiotics. Importance in medicine.	Characteristics and functions. The content in food. Daily allowance. Shortage: signs and consequences. The history of the discovery of antibiotics. Definition of antibiotics. Antibiotics included in the group of aminoglycosides. Classification of antibiotics.	LO 4 LO 6	1/4	Presentation	Oral interview
12	***Practical lesson No. 12. Topic:*** Carbohydrates. Monosaccharides, oligo- and polysaccharides.	Classification (aldoses and ketoses, pentoses and hexoses). Stereoisomerism. D- and L-stereochemical series. Chemical properties of monosaccharides. Reactions involving alcohol hydroxyl groups (acylation, alkylation): formation of complex esters (acetates, phosphates) and esters. Reactions of semi-acetal hydroxyl: reducing properties of aldose, formation of glycosides. The structure and biological significance of oligo- and polysaccharides.	LO 4	2	Working in small groups, lab.work	Oral interview/test control, protection of laboratory results

	SIWT No.9/SIW SIW Assignment No. 9 Heteropolysaccharides and their role in biology and medicine.	Heteropolysaccharides. Structure and classification. Heparin, hyaluronic acid, chondroitin sulfates, etc. Important functions of polysaccharides. Disorders of carbohydrate metabolism	LO 4 LO 6	1/4	presentation	Oral interview
13	***Practical lesson No. 13. Topic:*** Biologically important heterocyclic compounds.	The importance of biologically important five- and six-membered heterocyclic compounds with one and two heteroatoms in medicine and pharmacy. Hydroxy- and amino derivatives of pyrimidine and purine: uracil, thymine, cytosine, hypoxanthine, xanthine, uric acid, adenine, guanine. Lactim-lactam tautomer's.	LO 5	3	Working in small groups, lab.work	Oral interview/ test control, protection of laboratory results
	SIWT No. 10 /SIW SIW Assignment No. 10 Alkaloids. Classification of alkaloids and their importance in medicine.	Alkaloids. Definition, nomenclature, structure and significance in medicine. The main properties of alkaloids. Salt formation. Chemical classification of alkaloids. Methods of isolating alkaloids from plant raw materials.	LO 5 LO 7	1/3	presentation	Oral interview
14	***Practical lesson No. 14. Topic:*** Nucleic acids. DNA and RNA.	Nucleic acids. Nucleosides, nucleotides. Purine and pyrimidine nucleosides. Structure, nomenclature. The nucleotides. Structure and nomenclature of nucleoside monophosphates. DNA and RNA, and their biological functions in a living organism.	LO 4 LO 5	3	working in small groups	Oral interview/ test control
	SIWT No. 11 /SIW SIW Assignment No. 11 Unsaponifiable lipids	Unsaponifiable lipids. Isoprenoids. Terpenes, steroids, carotenoids. Cholesterol and its importance for health. The biological role of steroids in living organisms	LO 4 LO 6	1/4	presentation	Oral interview
15	***Practical lesson No. 15. Topic:*** Saponified lipids.	Classification of lipids. Fats. Nomenclature and isomerism of fats. Chemical properties of fats. Saponification number. Phospholipids are the main structure of biomembranes. Glycolipids.	LO 4	2	working in small groups	Oral interview/ test control

	SIWT No. 12 Consultation on the implementation of RC 2. **Midterm No. 2**	Control of the assimilation of theoretical knowledge and practical skills on the topics of lectures, practical exercises and SIW (topics 9-15).	LO 7	1/5	Oral and written. ticket survey or comp. test	Oral and written survey
	Preparation and conduct of the interim assessment			12		

Total: 120 hours

9.	**Teaching and learning methods**	
9.1	Lectures	- Overview. For feedback, students are given the opportunity to ask questions on the topic.
9.2	Practical lessons	- Work in small groups, discussion of key issues, presentation; - work in small groups, performing laboratory work.
9.3	SIWT /SIW	consultations on all issues that arise, independent study of the topics highlighted in the plan, preparation of presentations, discussion of the results of individual and group assignments, work with tables, textbooks, test assignments, work with interactive training programs, work with literature, electronic databases, tasks and exercises.
9.4	Border control	Oral and written ticket survey

10.	**Evaluation criteria**
10.1	**Criteria for evaluating the learning outcomes of the discipline**

№ LO	**Name of learning outcomes**	**Unsatisfactory**	**Satisfactory**	**Well**	**Great**
LO 1	-demonstrates knowledge of chemical processes (the main types of reactions) in the body that obey the general laws and patterns of chemistry, as well as the general energetic and kinetic patterns of chemical processes.	-does not know the theories, concepts and directions on the topic, does not demonstrate his knowledge, does not answer questions.	-has a vague understanding of theories, concepts, and directions on the topic, poorly demonstrates his knowledge, and answers questions with fundamental errors.	-competently, is guided by theories, concepts and directions on the topic, demonstrates his knowledge, answers questions with unprincipled errors.	-logically, clearly, competently, is guided by theories, concepts and directions on the topic, demonstrates his knowledge, answers all questions. He also answers additional questions logically and competently.
	-demonstrates knowledge about the classification, properties and application in medicine of the	-does not know the classification and properties of the main classes of organic compounds. And he does not	- does not clearly know the classification and properties of the main classes of	-knows the classifications and properties of the main classes of organic compounds. But	-clearly knows the classifications and properties of the main classes of

	main classes of organic compounds.	know how to connect this knowledge with medicine.	organic compounds. And he does not know how to connect this knowledge with medicine.	he does not know how to connect this knowledge with medicine.	organic compounds. He also knows how to connect this knowledge with medicine.
LO 2	-applies knowledge of calculation formulas (mass fraction, molar concentration, molar equivalent concentration, molar concentration, molar fraction, titer) in the preparation of solutions of specified concentrations and understands methods for determining the quantitative content of substances in the studied systems, including biological fluids.	- does not know the calculation formulas for expressing the concentration of solutions. Does not know how to choose formulas when preparing solutions. Does not know how to draw conclusions about the quantitative content of substances in the studied liquids.	- does not clearly know the calculation formulas for expressing the concentration of solutions. He does not reason well in choosing formulas when preparing solutions. And he does not know how to draw conclusions about the quantitative content of substances in the studied liquids.	- does not clearly know the calculation formulas for expressing the concentration of solutions. He does not reason well in choosing formulas when preparing solutions. And he does not know how to draw conclusions about the quantitative content of substances in the studied liquids.	- clearly knows the calculation formulas for expressing the concentration of solutions. Logical reasoning is correct in choosing formulas when preparing solutions. And he is able to draw conclusions about the quantitative content of substances in the studied liquids.
LO 3	- formulates the general theoretical foundations of chemistry, knows about various types of balances of chemical reactions and vital processes; mechanisms of action of the body's buffer systems, their interrelation and role in maintaining acid-base homeostasis for knowledge, skills and abilities	- formulates the general theoretical foundations of chemistry, knows about various types of balances of chemical reactions and vital processes; mechanisms of action of the body's buffer systems, their interrelation and role in maintaining acid-base homeostasis for knowledge, skills and abilities in their subsequent professional activities.	is not literate, is guided by the general theoretical foundations of chemistry, has little knowledge of the various types of balances of chemical reactions and vital processes; the mechanisms of action of the body's buffer systems, their interrelation and role in	indistinctly but competently, guided by the general theoretical foundations of chemistry, knows about various types of balances of chemical reactions and vital processes; mechanisms of action of the body's buffer systems, their interrelation and role in maintaining acid-base homeostasis;	competently, guided by the general theoretical foundations of chemistry, logically, clearly knows about the various types of balances of chemical reactions and vital processes; the mechanisms of action of the body's buffer

	in their subsequent professional activities. - demonstrates knowledge about the role of biogenic elements and their compounds in living systems; physico-chemical bases of surface phenomena; features of adsorption at various phase boundaries; physico-chemical properties of dispersed systems and solutions of biopolymers.	- does not know about the role of biogenic elements and their compounds in living systems; about the physico-chemical bases of surface phenomena; about the features of adsorption at various phase boundaries; does not demonstrate knowledge about the physico-chemical properties of dispersed systems and solutions of biopolymers. Does not answer questions.	maintaining acid-base homeostasis; gives a vague conclusion and cannot relate the topic to his future profession. - does not clearly know about the role of biogenic elements and their compounds in living systems; about the physico-chemical bases of surface phenomena; about the features of adsorption at various phase boundaries; poorly demonstrates knowledge about the physico-chemical properties of dispersed systems and solutions of biopolymers. Answers questions with fundamental errors.	gives a vague conclusion, but does not know how to connect the topic with a future profession. - competently demonstrates knowledge about the role of biogenic elements and their compounds in living systems; about the physico-chemical bases of surface phenomena; about the features of adsorption at various phase boundaries; demonstrates knowledge about the physico-chemical properties of dispersed systems and solutions of biopolymers. Answers questions with unprincipled errors	systems, their interrelation and role in maintaining acid-base homeostasis; gives a clear independent conclusion and is able to connect the topic with the future profession. - logically and competently demonstrates knowledge about the role of biogenic elements and their compounds in living systems; about the physico-chemical bases of surface phenomena; about the features of adsorption at various phase boundaries; demonstrates knowledge about the physico-chemical properties of dispersed systems and solutions of biopolymers. He also answers additional questions logically and competently.

LO 4	Demonstrates knowledge of the relationship between the chemical properties of organic compounds and their biological activity.	does not know and does not know how to connect the chemical properties of organic compounds with their biological activity.	does not clearly know about the chemical properties of organic compounds and their relationship to biological activity.	knows exactly about the chemical properties of organic compounds, but cannot clearly relate them to biological activity.	Clearly, knows about the chemical properties of organic compounds, and clearly knows how to associate them with biological activity.	
LO 5	knows the basics of heterocyclic compounds as the basis for the creation of medicines and the features of acid-base properties of amino acids and proteins and their role in maintaining acid-base homeostasis.	does not know the basics of heterocyclic compounds as the basis for creating medicines, does not understand the specific acid-base properties of amino acids and proteins, and does not understand their role in maintaining acid-base homeostasis.	knows the basics of heterocyclic compounds as the basis for creating medicines, but does not understand the specifics of the acid-base properties of amino acids and proteins, and also does not understand their role in maintaining acid-base homeostasis.	clearly knows the basics of heterocyclic compounds as the basis for creating medicines, clearly understands the features of acid-base properties of amino acids and proteins, but does not clearly understand their role in maintaining acid-base homeostasis.	clearly knows the basics of heterocyclic compounds as the basis for creating medicines, clearly understands the features of acid-base properties of amino acids and proteins, and also clearly understands their role in maintaining acid-base homeostasis.	
LO 6	Using his teaching skills, he publicly presents his own judgments, analysis and synthesis of information in the field of chemistry in medicine.	does not know how to demonstrate learning skills. He does not know how to express his own judgments, does not know how to analyze and synthesize information in the field of chemistry in medicine. Doesn't know how to draw conclusions	hesitantly demonstrates learning skills. It is unclear what his own judgments are, how to analyze and synthesize information in the field of chemistry in medicine. He does not know how to draw conclusions on his own and connect information	clearly demonstrates learning skills. Confidently expresses his own judgments, analyzes and synthesizes information in the field of chemistry in medicine. He is able to draw conclusions on his own, but is not clearly able to connect information with a future profession.	clearly demonstrates learning skills. He freely and confidently expresses his own judgments, clearly analyzes and synthesizes information in the field of chemistry in medicine. is able to draw conclusions on his own and connect information	

			with his future profession.		with his future profession.
LO 7	Adheres to the principles of academic integrity and learning behavior when performing written papers and answering exams.	does not answer theoretical questions, test assignments, or written papers. Adheres to academic integrity.	When answering theoretical questions, test assignments, and written papers, he makes fundamental mistakes. Adheres to academic integrity.	When answering theoretical questions, test assignments, and written papers, he makes minor mistakes. Adheres to academic integrity.	provides a complete answer to all theoretical questions and test assignments; responds logically and competently to written papers. Adheres to academic integrity.

10.2 Assessment methods and criteria

A checklist for practical training.

Form of control	Evaluation	Evaluation criteria
Practical, laboratory classes	95-100% (4,0; A)	The student has completed all practical and laboratory work and provides a complete answer to all theoretical questions and test assignments. Actively participates, becomes the absolute leader in the group, knows how to conduct a dialogue between subgroups, uses self-assessment and mutual assessment.
	90-94% (3,67; A-)	The student has completed all the practical and laboratory work and gives a complete answer to all the test questions. Actively participates, leads the subgroup, knows how to conduct a dialogue between subgroups, uses self-assessment and mutual assessment.
	80-89% (3,0; B; 3,33; B+)	The student knows the theoretical questions, has completed laboratory work and reports on them in a timely manner, and has made unprincipled mistakes while answering practical classes; a positive test score. Actively participates in the subgroup, knows how to conduct a dialogue between subgroups, uses self-assessment.
	70-79% (2,33; C+; 2,67; B-)	The student knows the theoretical questions, has passed laboratory work and reports on them in a timely manner, and has made fundamental mistakes during the answer in practical classes; a positive test score. He does not actively participate in the subgroup, knows how to conduct a dialogue between subgroups, and uses self-assessment.
	60-69% (1,67; C-; 2,0; C)	The student experiences some difficulties in answering practical exercises, and has made logical and stylistic mistakes in answering. He completed laboratory work on time, submitted all reports on them; showed little activity in the classroom and needed the help of a teacher, partially completed the test tasks.
	50-59% (1,0; D+)	The student has made gross mistakes in answering theoretical questions and does not understand the questions of the topic. I have not fully completed the laboratory work and reports on it, and I have not completed the test tasks. Was not active in the subgroup.
	0-49% (0.24; F; 0.5; FX)	The student did not prepare, did not know the topic and purpose of the lesson, and also did not complete the laboratory work, did not submit reports and did not participate during the lesson, did not complete the test tasks. Was not active in the subgroup.

Form of control	Evaluation	Evaluation criteria
Oral interview	**Excellent** Corresponds to the estimates: A (4,0; 95-100%); A- (3,67; 90-94%)	The student answered all the questions logically, clearly, competently, guided by theories, concepts and directions on the topic. He also logically and competently answers additional questions from the teacher.
	Good Corresponds to the estimates: B+ (3,33; 85-89%); B (3,0; 80-84%); B- (2,67; 75-79%) C+ (2,33; 70-74%)	The student made unprincipled inaccuracies in the answers, not fundamental mistakes that he corrects himself. Answers additional questions from the teacher. The student made unprincipled inaccuracies in the answers, not fundamental mistakes that he corrects himself. He answers the teacher's additional questions with unprincipled errors.
	Satisfactory Corresponds to the estimates: C (2,0; 65-69%); C- (1,67; 60-64%); D+ (1,33; 55-59%) D (1,0; 50-54%)	The student made fundamental mistakes in the answers, which he corrects with the help of the teacher. He answers additional questions with fundamental errors. The student made fundamental mistakes in the answers, which are difficult to correct with the help of a teacher. He makes blunders on additional questions.
	Unsatisfactory Corresponds to the estimates: FX (25 - 49%) F (0-24)	The student made blunders in the answers, which he cannot correct, even with leading questions from the teacher. The teacher cannot answer any additional questions.
Form of control	**Evaluation**	**Evaluation criteria**
Problem solving	95-100% (4,0; A)	- the correct algorithm for solving the problem has been compiled, there are no errors in logical reasoning and in the choice of formulas and solutions, the correct answer has been obtained, the problem has been solved in a rational way; it gives a complete and clear explanation of the solution of the problem, the ability to draw conclusions based on the data obtained.
	90-94% (3,67; A-)	- the correct algorithm for solving the problem has been compiled, there are grammatical errors in logical reasoning and in the choice of formulas and solutions, the correct answer has been received, the problem has been solved in a rational way; the ability to draw conclusions based on the data obtained.
	80-89% (3,0; B; 3,33; B+)	- the correct algorithm for solving the problem has been compiled, there are no significant errors in logical reasoning and solution; the choice of formulas for the solution has been made correctly; there is an explanation for the solution, but the problem has been solved in an irrational way or no more than two insignificant errors have been made, the correct answer has been received.
	70-79% (2,33; C+; 2,67; B-)	- the correct algorithm for solving the problem has been compiled, there are no significant errors in the solution; the choice of formulas for the solution has been made correctly; but there is no complete and clear explanation of the solution, and the problem has been

		solved in an irrational way or more than two insignificant errors have been made, the correct answer has been received.
	60-69% (1,67; C-; 2,0; C)	- the problem has been solved, but significant errors have been made in the choice of formulas or in mathematical calculations, the problem has not been fully solved
	50-59% (1,0; D+)	- the problem was solved incorrectly, there are significant errors in logical reasoning and in the solution.
	0-49% (0.24; F; 0.5; FX)	- the task has not been solved, there is no response to the task.

Form of control	
Testing. It is evaluated according to a multi-point knowledge assessment system	

Checklist for *SIWT /SIW*		
Form of control	**Evaluation**	**Evaluation criteria**
Presentation of the topic	**Excellent** 95-100 mark 90-94 mark	The presentation was completed independently, on time, with a volume of at least 20 slides. At least 7 literary sources were used. The slides are informative and concise. During the defense, the author demonstrates deep knowledge of the topic. Does not make mistakes when answering questions during the discussion.
	Good 85-89 mark 80-84 mark 75-79 mark 70-74 mark	The presentation was completed independently, on time, with a volume of at least 17 slides. At least 6 literary sources were used. The slides are informative and concise. During the defense, the author demonstrates good knowledge of the topic. He makes unprincipled mistakes when answering questions that he corrects himself.
	Satisfactory 65-69 mark 60-64 mark 50-54 mark	The presentation was completed independently, on time, with a volume of at least 14 slides. At least 5 literary sources were used. The slides are not informative. During the defense, the author makes fundamental mistakes when answering questions.
	Unsatisfactory 0,5; 25-49 mark 0:0-24 mark	The presentation was not completed on time, and the volume is less than 10 slides. Less than 5 literary sources were used. The slides are not informative. During the defense, the author makes gross mistakes when answering questions. Does not know his own material.

Intermediate certification		
Form of control	**Evaluation**	**Evaluation criteria**
Midterm	95-100% (4,0; A)	The student gives a complete answer to all theoretical questions and test tasks, and knows how to evaluate others.

	90-94% (3,67; A-)	The student gives a complete answer to all theoretical questions and test assignments.
	80-89% (3,0; B; 3,33; B+)	The student gives a complete answer to all theoretical questions and test tasks, makes minor mistakes when solving problems.
	70-79% (2,33; C+; 2,67; B-)	The student makes mistakes in answering theoretical questions, makes minor mistakes in solving problems.

A multi-global knowledge assessment system			
Evaluation of the letter system	The digital equivalent of points	Percentage content	Assessment according to the traditional system
A	4,0	95-100	Excellent
A -	3,67	90-94	
B +	3,33	85-89	Good
B	3,0	80-84	
B -	2,67	75-79	
C +	2,33	70-74	
C	2,0	65-69	Satisfactory
C -	1,67	60-64	
D+	1,33	55-59	
D-	1,0	50-54	
FX	0,5	25-49	Unsatisfactory
F	0	0-24	

11.	**Educational resources**
Electronic resource:	**SKMA Electronic Resources SKMA** 1. Electronic Library - https://e-lib.skma.edu.kz/genres 2. Republican Interuniversity Electronic Library (RSEB) – http://rmebrk.kz://rmebrk.kz/ 3. Aknurpress Digital LibraryAknurpress- https://www.aknurpress.kz/ 4. Epigraph Electronic Library - http://www.elib.kz / 5. Epigraph - portal for multimedia textbooks https://mbook.kz/ru/index/ 6. **EBS IPR SMART** https://www.iprbookshop.ru/auth 7. information and legal system "Zan" - https://zan.kz/ru 8. Medline Ultimate EBSC 9. eBook Medical Collection EBSC 10. Scopus - https://www.scopus.com
Electronic textbooks	1. Zhol'nin A.V. Obshchaya khimiya [General chemistry]: textbook / A.V. Zhol'nin. - Electron. text messages. (40.9 Mb). Moscow: GEOTAR-Media, 2017. e-opt. disk 2. General chemistry: textbook. Zhol'nin A.V. / Edited by V. A. Popkov. 2012. - 400 p.: ill. http://www.studmedlib.ru / 3. Zhalpy khimiya. Kerimbayeva K. Z. , 2019 https://aknurpress.kz / login 4. Seitembetov T. S. Chemistry / Seitembetov T. S., 2020. - 273 p. https://elib.kz/ru/search/read_book/2962/Болысбекова Bolysbekova

	5. S. M. Khimiya biogennykh elementov [Chemistry of biogenic elements]. https://elib.kz/ru/search/read_book/237/Глинка 6. N. L. Zhalpy khimiya [Zhalpy's chemistry]. I volume / Glinka N. L., BabkinaS.S., 2020. 204 b https://www.elib.kz/ru/search/read_book/707/Глинка 7. N. L. Zhalpy khimiya [Zhalpy's chemistry]. II volume / Glinka N. L., BabkinaS.S., 2020. 156 b. https://www.elib.kz/ru/search/read_book/709/Глинка 8. N. L. Zhalpy khimiya [Zhalpy's chemistry]. Volume III / Glinka N. L., BabkinaS.S., 2020. 232 b. https://www.elib.kz/ru/search/read_book/710/ 9. https://www.elib.kz/ru/search/read_book/710 Glinka N. L. Zhalpy khimiya [Zhalpy chemistry]. IV volume / Glinka N. L., BabkinaS N. S., 2020. 157c. https://elib.kz/ru/search/read_book/712/Глинка 10. N. L. Obshchaya khimiya [General chemistry]. I volume / Glinka N. L., BabkinaS N. S., 2020. 212. https://www.elib.kz/ru/search/read_book/713/Глинка 11. N. L. Obshchaya khimiya [General chemistry]. II volume / Glinka N. L., BabkinaS.S., 2020. 164 https://www.elib.kz/ru/search/read_book/715/Глинка 12. N. L. Obshchaya khimiya [General chemistry]. Volume III / Glinka N. L., BabkinaS.S., 2020. 240 https://www.elib.kz/ru/search/read_book/717/Глинка 13. N. L. Obshchaya khimiya [General chemistry]. IV volume / Glinka N. L., BabkinaS N. S., 2020. 162 https://www.elib.kz/ru/search/read_book/718/Патсаев 14. A. K. Patsaev, S. S. Babkina, O. Baktybaev, and N. Kuatbekov, Bioorganic Chemistry, 2020, 345 p. www.elib.kz 15. Teoreticheskie osnovy organicheskoi khimii Almaty: Evero, 140 p . (in Russian) https://www.elib.kz/ru/search/read_book/769/ 16. Patsaev A. K. Educational and methodical manual for laboratory practical classes in organic chemistry/Patsaev A. K., Alikhanov Kh. B., Akhmetova A. A., 2020-165c. https://www.elib.kz/ru/search/read_book/776/Лабораторные/физические
Laboratory/physical resources	1. Determination of the pH of solutions using indicators. https://youtu.be/533pZ2DJaLo 2. Influence of the concentration of reactants on the rate of chemical reaction. https://youtu.be/cbEpdFRyevw 3. Study of the temperature dependence of the reaction rate. https://youtu.be/dxkGLDZj-jM 4. Preparation of hypertonic solution. https://youtu.be/sdzOSL0qE_0 5. Chemical equilibrium and its displacement The effect of changes in concentration on the displacement of equilibrium. https://youtu.be/5GHWeYIlaN0 6. Preparation of sols. https://youtu.be/E5kb-NwtAA8 7. Study of adsorption on activated carbon. https://youtu.be/MlyrRJ4i2EU 8. Complex connections. https://youtu.be/v-V88-U1hyA 9. Reactivity of alcohols and phenols. https://youtu.be/B-soFkXAkDM 10. Practical lesson. Acid-base balance. Buffer systems. https://youtu.be/a9dImNi357Q 11. Practical lesson. Biogenic elements. Complex connections. https://youtu.be/goC_0Bz5uRM 12. Practical lesson. Redox processes. https://youtu.be/uaIK7WMAMGA 13. Practical lesson. Surface phenomena. Adsorption. https://youtu.be/AUqwj2VQov0 14. Practical lesson. Acidity and basicity of organic compounds. https://youtu.be/rkLI6CvOhgo 15. Practical lesson. Oxo compounds. https://youtu.be/A53QilhuBwg 16. Practical lesson. Heterofunctional compounds. https://youtu.be/zNJppCH4s7s 17. Practical lesson. Amino acids. Peptides. https://youtu.be/lHDMSptZOvE 18. Practical exercises. Carbohydrates. https://youtu.be/NgMI7VAAW5g

	19. Practical lesson. Heterocyclic compounds. Nucleic acids. https://youtu.be/pVCiB8e9_2w 20. Practical lesson. Lipids. https://youtu.be/eZ5VNSYxwa4
Literature	**In Russian:** **Main:** 1. Glinka N. L. Obshchaya khimiya [General chemistry], vol. 1: ucheb. Posobie dlya vuzov - Almaty : Evero, 2014 2. Glinka N. L. Obshchaya khimiya [General chemistry], vol. 2: ucheb. Posobie dlya vuzov - Almaty : Evero, 2014 3. Glinka N. L. Obshchaya khimiya [General Chemistry], vol. 3: ucheb. Posobie dlya vuzov - Almaty : Evero, 2014 4. Glinka N. L. Obshchaya khimiya [General chemistry], vol. 4: ucheb. handbook for universities. Almaty: Evero Publ., 2014 5. ZurabyanS. E. Organic Chemistry: textbook. DZourabyan S. E., Luizin A. P.; edited by N. A. Tyukavkina, Moscow : GEOTAR - Media, 2013, 384 p. 6. (in Russian). Textbook. Moscow: GEOTAR-Media Publ., 2014 **Additional information:** 1. Verentsova L. G., Nechepurenko E. V. Inorganic, physical and colloidal chemistry. Almaty: Evero Publishing House, 2014. 2. Patsaev, A. K. " Functional derivatives of hydrocarbons "[Text] : textbook. manual / A. K. Patsaev; Ministry of Healthcare of the Republic of Kazakhstan. Almaty : Evero Publ., 2014. 404 **pages In English** 1. Glinka, N. L. General chemistry. Volum 1. : manual for graduate students / N. L. Glinka, S. S. Babkina. - 27th ed. - Almaty : "Evero" , 2017. - 232 p. 2. Glinka, N. L. General chemistry. Volume 2.: manual for graduate students / N. L. Glinka, S. S. Babkina. - 27th ed. - Almaty : "Evero" , 2017. - 176 p. 3. Glinka, N. L. General chemistry. Volum 3.: manual for graduate students / N. L. Glinka, S. S. Babkina. - 27th ed. - Almaty : "Evero" , 2017. - 248 p. 4. Glinka, N. L. General chemistry. Volum 4.: manual for graduate students / N. L. Glinka, S. S. Babkina. - 27 th ed. - Almaty : "Evero" , 2017. - 176 p. 5. Nazarbekova, S. P. Chemistry: textbook / S. P. Nazarbekova, A. Tukibayeva, U. Nazarbek. - Almaty : Association of hiigher educationalinstitutions of Kazakhstan, 2016. - 304 p. 6. Shokybayev, Sh. A. Teaching methods on chemistry: textbook / Sh. A. Shokybayev, Z. O. Onerbayeva, G. U. Ilyassova. - Almaty: [s. n.], 2016. - 271 p.

12.	**Discipline Policy**

Requirements for students, attendance, behavior, etc.
- mandatory attendance at lectures and laboratory classes and CPR according to the schedule;
- do not be late for classes, wear special clothes (robes, hats) during classes;
- do not miss classes, provide a certificate in case of illness;
- work out the missed classes at the time specified by the teacher;
- actively participate in the educational process, comply with the academy's internal regulations and ethics of conduct, complete homework and SRS in a timely and accurate manner;
If the tasks are not completed, the final score is reduced.
- be tolerant, open and friendly to fellow students and teachers;
- treats the property of the department carefully;
- if you skip lectures without a valid reason, penalty points are introduced - 1 point for each skip;
- if you skip the SRS without a valid reason, penalty points are introduced – 2 points are deducted for each SRS pass.

- All types of students' written papers are checked for plagiarism.
- with current academic performance, students' academic achievements are evaluated on a 100-point scale for each completed task (answer in current classes, passing the SRS, boundary control).
- The academic performance journal does not display a digital equivalent score, but its percentage expression.
- Rating points are entered into the electronic journal once a week and only once. It is not allowed to change the rating score.
- A change in the rating score is allowed according to the work schedule issued by order of the dean's office on the basis of a certificate of valid reason (for example: health status).
- At the end of the academic period, the result of the progress control (ORD) is calculated by calculating the arithmetic mean of all grades received during the academic period multiplied by a factor of 0.6.
- The minimum admission rating for the exam is 50 points or 30%
- The final assessment of the discipline includes assessments of the rating admission and final control. The admission rating is 60% of the final assessment of knowledge in the discipline, and the exam score is 40% of the final assessment of knowledge in the discipline.
- The data center and digital content are placed by the teacher in the Assignment module for the attached academic group (stream). All types of educational videos are linked to the SKMA Youtube channel or others. source.

13.	**Academic policy based on the moral and ethical values of the Academy**
	Academic policy. Item 4 of the Student's Honor Code The student strives to become a worthy citizen of the Republic of Kazakhstan, a professional in his chosen specialty, and to develop the best qualities of a creative personality. The student treats his elders with respect, does not allow rudeness towards others and shows empathy for socially vulnerable people and, as far as possible, takes care of them. The student is a model of decency, culture and morality, is intolerant of immorality and does not allow discrimination based on gender, nationality or religion. The student leads a healthy lifestyle and completely abandons bad habits. The student respects the traditions of the university, protects its property, and ensures cleanliness and order in the student dormitory. The student recognizes the necessary and useful activities aimed at the development of creative activity (scientific, educational, sports, artistic, etc.), to enhance the corporate culture and image of the university. Outside the walls, the student always remembers that he is a representative of a higher school and makes every effort not to compromise his honor and dignity. The student considers it his duty to combat all types of academic dishonesty, including: cheating and asking others for help in passing knowledge control procedures; presenting any volume of ready-made educational materials (essays, term papers, tests, theses and other works), including online resources, as the results of his own work; using family or business ties to get a higher grade; absenteeism, tardiness, and missing classes without a valid reason. The student considers all the listed types of academic dishonesty as incompatible with obtaining a high-*quality and competitive education worthy of the future economic, political and managerial elite of Kazakhstan.*
	Grading policy for the Bachelor's Degree discipline ***1.*** Assessment of students' academic achievements involves assessment of current control, boundary control and final certification of students. 2. The current control of students' knowledge is carried out within the framework of practical (seminar, laboratory) classes with daily filling out of the educational journal of students' progress and the electronic journal until the end of the week. A student who has missed a lesson, lecture, or dropout (if he is not released from classes according to the order of the dean of the faculty) is marked "z" (the language of filling in is Kazakh); "n" (the language of filling in is Russian); "a" (the language of filling in is English).

3. Missed classes for a disrespectful reason are not worked out.
Students who missed classes for disrespectful reasons or did not work in an electronic journal, next to the "h" mark, a "0" grade is given in the last week of the academic period.
4. Missed classes for a valid reason are worked out when providing an exculpatory document (due to illness, family circumstances or other objective reasons). The student is required to provide a certificate no later than 5 working days from the date of its receipt. In the absence of supporting documents or if they are submitted to the dean's office later than 5 working days after graduation, the reason is considered disrespectful. The student submits an application addressed to the dean and receives a work leave sheet with an indication of the deadline, which is valid for 30 days from the date of receipt by the dean's office. Students who have missed classes for a valid reason will receive a grade in the electronic journal next to the "h" mark, which was obtained as a result of practicing the lesson. In this case, the "h" mark is automatically canceled.
5. Students who missed classes by order of the dean on their release will not be given an "h" mark, but a grade obtained as a result of working out the lesson will be given. The form of control is determined by the department (department policy).
6. By the 1st day of each month, the departments submit to the dean's office information on student academic performance.
7. Boundary control of students' knowledge is carried out at least twice during one academic period for 7-8/ 14-15 weeks of theoretical training, with the results of boundary controls recorded in the academic performance journal and the electronic journal, taking into account penalty points for missing lectures (missing lectures in the form of penalty points are deducted from the boundary control assessments). The penalty point for skipping 1 lecture is 1.0 points. A student who fails to attend the border control without a valid reason is not allowed to take the exam in the discipline. A student who has failed to attend the border control for a valid reason, immediately after starting classes, submits an application addressed to the dean, provides exculpatory documents (due to illness, family circumstances or other objective reasons), receives a work sheet, which is valid for the period specified in paragraph 12.4. The results of the border control are submitted to the dean's office in the form of a report until the end of the control week.
8. The SIW score is issued in SIWT classes according to the schedule in the academic performance journal and the electronic journal, taking into account penalty points for skipping SIWT classes (skipping SIWT classes in the form of penalty points is subtracted from the SIW grades). The penalty point for skipping 1 session of the SIWT is 2.0 points.
9. A student who does not score a passing score (50%) on one of the types of controls (current control, boundary control No. 1 and/or No. 2) is not allowed to take the exam in the discipline.
10. Correction of assessments of current and boundary controls is carried out in case of technical errors in filling out the electronic journal on the basis of an explanatory note from the teacher (signed by the head of the department) indicating the reason; submission of supporting documents (journal of academic performance, etc.); permission from the vice-rector for academic and methodological work.
11. Students' knowledge is assessed according to a point-rating letter system, according to which 60% is current control, 40% is final control.
12. The final score is calculated automatically based on the average score of the current control, the average score of the boundary controls, and the final control score.:
Final Score (100%) = Admission Rating (60%)+ Final control (40%)
Admission rating (60%) = Average score of border controls (20%)+ Average score of the current control (40%)
Average score of frontier controls = Frontier control1 + Frontier control2/2
Average score of current controls = arithmetic mean sum of current estimates, taking into account the average SIW score
Final score (100%) = RCsr x 0.2 + TCsr x 0.4 + IC x 0.4
RCsr – average assessment of border controls

TKsr – average assessment of current control
IR assessment of the final control
13. The student's level of mastery of the discipline is reflected in the examination sheet on a 100-point scale, corresponding to the letter system with a numeric equivalent accepted in international practice (positive grades, in descending order, from "A" to "D", and "unsatisfactory" - "GX", "F") and grades according to the traditional system.
14. The final control is carried out in two stages if the Standard Program for the discipline provides for the admission of practical skills. During the two-stage final control, practical skills are acquired using the OSPE method./OCE with the involvement of independent examiners. Students who are not certified in the first stage are not allowed to take the second stage of the exam – testing.
15. Based on the results of the interim assessment, students are awarded a scholarship under the state educational grant, provided they pass all exams with grades from "A" to "C+".
16. A student who has entered the academy after graduation (bachelor's degree), in order to obtain a second higher education, has the right to be exempt from attending disciplines in which he has a positive final result.
17. The results of final grades in the form of a credit for previous education are taken into account when awarding a scholarship.

14. Approval and revision

Date of approval with the Library and Information Center	Protocol No. 7 25.06.25	Full name of the head of the BIC Darbicheva R. I.	Signature
Date of approval at the Department	Protocol No. 11.1 26.06.2025	Head of theDepartment of Chemical Disciplines, Biology and Biochemistry Daurenbekov K. N.	Signature
Date of approval at the AK OP	Protocol No. 6 27.06.2025	Chairman of AK OP Auezkhankyzy D.	Signature
Date of revision at the Department	Protocol No. ___	Head of theDepartment of Chemical Disciplines, Biology and Biochemistry Daurenbekov K. N.	Signature
Date of revision on AK OP	Protocol No. ___	Chairman of AK OP Auezkhankyzy D.	Signed