OŃTÚSTIK QAZAQSTAN  MEDISINA  AKADEMIASY  «Оңтүстік Қазақстан медицина академиясы» АҚ  ОМОТОВ В СТАТИТЕТТИК ОДЕМИНО В СТАТИТЕТТИКА О СТАТИТЕТТИТЕТТИКИ О СТАТИТЕТТИТЕТТИКИТЕТТИТЕТТИТЕТТИТЕТТИКИ О СТАТИТЕТТИТЕТТИТЕТТИ	ицинская академия»
Department of «Biology and Biochemistry», «Chemical disciplines», «Microbiology, virology and immunology», «Pathological anatomy and histology»	46- p. 42 from p. 42
Syllabus	

#### **Syllabus**

### Working educational program of discipline (Syllabus) "Structural organization of human physiological processes"

#### Educational program 6B10115 "Medicine"

1.	General information about the discipli	General information about the discipline				
1.1	Discipline code: SOFPCH 1203	1.6	Academic year:2023-2024			
1.2	Name of the discipline: "Structural	1.7	Course:1			
	organization of human physiological					
	processes"					
1.3	Prerequisites: a school course in	1.8	Semester:1			
	biology, chemistry, physics.					
1.4	Post-requirements: «Genes and	1.9	Number of credits (ECTS):6			
	heredity».					
1.5	Cycle: basic disciplines	1.10	Component: internal/structural component			
2.	Description of the discipline (maximum	n 50 words)				

Understands the role of molecular genetics and cellular mechanisms of the functioning of the body in norm and pathology for the effective diagnosis and prevention of common diseases, the principles of the use of molecular genetic methods and technology in medicine.

He knows molecular genetic methods and technologies for the diagnosis of diseases; uses the genealogical method for the prediction of hereditary human diseases; is able to distinguish between types of chromosomes for the recognition of normal and pathological human karyotypes.

3.	Summative assessment form		
3.1	Testing +	3.5	Coursework
3.2	Written	3.6	Essay
3.3	Oral	3.7	Project
3.4	OSPE or Practical skills reception	3.8	Other (specify)

#### 4. Objectives of the discipline

Formation of students' modern knowledge of molecular biology as a complex discipline combining the latest knowledge on the molecular organization of animal cells and DNA technologies, as well as the formation of basic knowledge in the field of modern biology and high technologies necessary for the development of general professional disciplines and in clinical practice.

5.	Final learning outcomes (LO disciplines)					
LO1.	Demonstrates knowledge and understanding of biomedical sciences for diagnosis, treatment, and					
	dynamic observation of the most common diseases in children.					
LO2.	Demonstrates knowledge about the structure and function of informational macromolecules,					
	mechanisms of transfer and expression of genetic information.					
LO3.	Demonstrates knowledge of the origins and classifications of mitochondrial, lysosomal, peroxisomal					
	diseases					
LO4.	-demonstrates knowledge of chemical processes (basic types of reactions) in the body,					
	obeying general laws and regularities of chemistry, as well as general energetic and					
	kinetic laws of chemical processes;					
LO5.	applies knowledge of calculating formulas (mass fraction, molar concentration, molar					
	equivalent concentration, molar concentration, molar concentration, molar fraction, titer) in					

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Syllabus	

			Syllabus					
		preparing						
		solutions of given con	g the quantitative					
		_	in the systems under study, including biological fluids	-				
Ι	.O6.	- formulates the general theoretical foundations of chemistry for knowledge, skills and abilities in						
		their subsequent professional activities.						
ī	.O7.		lge of the classification and biological properties of mi	croorganisms				
1	<i>1</i> 07.		phologic, physiologic, antigenic) and their ecology; methods of isolating					
		,	tification; principles of determining the	3				
т	.O8.		of microorganisms to antimicrobial agents;		f			
L	.08.		edge of/about the basics of microorganism gen					
			s of environmental factors on microorganisms, pur	•				
			erilization, disinfection, chemotherapy and disinfection		-			
			n, disinfection; chemotherapy and antibiotics; basic		gy of			
_	0.0		utes of infection, localization of microorganisms in the	•				
L	.O9.	•	paration of native smears, staining of smears by simpl					
			nicroscopy results; virus cultivation; determination of		ce of			
			imicrobial agents; and interpretation of microscopy res	sults.				
		antimicrobial agents;						
L	O10.		edge of the subject matter and objectives of an	natomy, histology	and			
		physiology, their impo	•					
			nd general regularities of functioning of cells, tissues,					
		regulation, considered	from the standpoint of general physiology and integra-	tive behavioral				
		human behavioral acti	· ·					
L	O11.	-distinguishes, describ	es, compares features of the structure of various cell-	s, tissues, organs o	of the			
		organism and explains	their functions;					
		- possesses the skills of	f conducting laboratory studies of cells and methods o	f processing				
		results;						
L	O12.	-Capable of visualizin	g and logically presenting information in the form of a	presentation.				
		- compares physiologi	cal parameters (constants) of a healthy and sick organi-	sm;				
		- analyzes the informa	tion obtained during experimental observations, detern	nines its				
		Significance for chara	cterizing the state of the organism.					
	5.1	LO disciplines	The results of the training of the OP, with which	the LO discipline	s are			
		•	associated	•				
		LO 1, LO4,	LO1 Applies fundamental knowledge in biomedical,	clinical, epidemio	logic			
		LO6, LO7,	and socio-behavioral sciences. biomedical, clinica		_			
		LO10	socio-behavioral sciences.	, ·F				
		2010	Socia comunicial selencesi					
		LO11, LO8,	LO2 Provides patient-centered care in the	biomedical, clin	nical,			
		LO5	epidemiologic sciences, aimed at the diagnosis, treat	,				
		LOS	the most common diseases.	ment, and prevention	OII OI			
		LO1, LO4,	LO3 Carries out its activities within the framework	of legislation DV ;	n the			
				_	iii tiie			
-		LO7, LO10	field of health care to ensure quality medical services		00#2			
		LO4,LO7,	LO4 Communicates effectively with patients, their t					
		LO12	providers in an ethical and health care provided					
			deontological manner, leading to effective informat					
1			deontology, resulting in effective information sha	ring and collabora	ation.			

# ойти́sтік qazaqstan медіsіна Академія Академія

Department of «Biology and Biochemistry», «Chemical disciplines»,
«Microbiology, virology and immunology», «Pathological anatomy and
histology»

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		Syllabus				
		cooperation				
	LO11, LO9,	1	diagnoses, treats	monitors a	nd rehab	pilitates pediatric and
	LO3, LO2		_			t patients, including
						ence-based medicine.
			n based on the princ	-		
	LO1, LO4,					n his/her professional
	LO6, LO9,		dering bioethics.			r
	LO12		8			
6.	Detailed information a	bout the disciplin	ie			
6.1	Place of the event (build			floor.		
6.2	Number of hours	Lectures	Practical lesson	Laborato	IWT	IWLT
				ry		
				session		
	Molecular biology	3	12		21	9
	Chemistry	4	16	_	28	12
	Microbiology	2	8		14	6
	Histology	3	12		21	9
6.3	Discipline Learning		1-			
0.0	Plan:					
No	Week/day	Lecture	Practical	IWLT	IWT	Date,
U 1.=	1 Tools and	Lecture	lesson	1,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		time
1	Molecular biology	1	1	1	2	
we	Histology	_	1	1	2	
ek	Chemistry	_	1	1	2	
	Microbiology	_	_	_	_	
2	Molecular biology	-	1	1	2	
we	Histology	1	1	_	_	
ek	Chemistry	-	1	1	2	
	Microbiology	-	1	_	_	
3	Molecular biology	_	1	1	2	
we	Histology	-	1	1	2	
ek	Chemistry	1	1	1	1	
	Microbiology	_	1	_	_	
4	Molecular biology	_	1	_	_	
we	Histology	-	1	1	2	
ek	Chemistry	-	1	1	2	
	Microbiology	1	1	1	2	
5	Molecular biology	1	1	-	2	
we	Histology	-	1	1	2	
ek	Chemistry	-	1	1	2	
	Microbiology	-	1	1	-	
6	Molecular biology	-	1	1	2	
we	Histology	1	1	-	-	
ek	Chemistry	-	1	1	2	
~11	Chemistry		-	-	<del>                                     </del>	

Microbiology

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7	Molecular biology	-	1	1	2	
we	Histology	-	1	1	2	
ek	Chemistry	1	1	-	-	
	Microbiology	-	1	1	2	
8	Molecular biology	-	1	1	2	
we	Histology	-	1	1	2	
ek	Chemistry	-	1	1	2	
	Microbiology	1	1		2	
9	Molecular biology	-	1	1	2	
we	Histology	1	1	-	-	
ek	Chemistry	-	1	1	2	
	Microbiology	-	1	1	-	
10	Molecular biology	-	-	1	-	
we	Histology	-	1	1	2	
ek	Chemistry	1	1	1	2	
	Microbiology	-	1	-1?	2	
11	Molecular biology	-	1	-	-	
we	Histology	1	1	1	2	
ek	Chemistry	-	1	1	2	
	Microbiology	-	1	1	2	
12	Molecular biology	-	1	1	2	
we	Histology	-	1	1	2	
ek	Chemistry	1	1	-	-	
	Microbiology	-	1	1	-	
13	Molecular biology	1	1	1	0.5	
we	Histology	-	2	-	-	
ek	Chemistry	-	1	1	1	
	Microbiology	-	-	1	2	
14	Molecular biology	-	-	-	-	
we	Histology	-	1	2	2	
ek	Chemistry	-	2	-	-	
	Microbiology	1	-1	1	2	
15	Molecular biology	-	-	-	-	
we	Histology	-	1	1	2	
ek	Chemistry	-	1	1	2	
	Microbiology	-	1	1	0,5	
_	T 0	-				

7.	Informat	tion at	oout 1	teachers	
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No	Full name	Degrees and	Email address	Research	Progress
		position		interests, etc.	
1.	Azhibayeva-	Master's	danakupen303	Development of	The author of over 26
	Kupenova D.T.	degree,	@mail.ru	PCR test systems	publications.
		Senior		in	
		teacher		pharmacogenetics	



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histology» Syllabus

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		Sy	/llabus		
2.	Erkekulova G.K.	Master's	ekk.33@mail.r	Anthropoecology	Author of more than 10
		degree,	<u>u</u>	of population of	publications
		Senior		Shymkent city	1
		teacher			
3.	Kanzhigitova M.	Master's	Molya 1503@	Study of	Author of more than 10
	8 7 7 7 7 7	degree,	mail.ru	solanaceous and	publications
		Senior		leguminous plants	F 0.0 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -
		teacher		according to the	
				law of	
				homological	
				series	
4.	Sarsenbekova A.A.	Master's	if_skma@mail.	Anthropoecology	Author of more than 10
		degree,	ru	of population of	publications
		Senior		Shymkent city	r wassanaan
		teacher			
5.	Santay B.	Master's	bsantaj@mail.r	Anthropoecology	Author of more than 10
		degree,	<u>u</u>	of population of	publications
		teacher	_	Shymkent city	1
6.	Yusupov	Master's	babur.skma@g	Mophological	Author of 36 international
	Baburkhan	degree,	mail.com	characteristics of	and republican scientific
	Khantureevich	Senior		the wound	publications
		teacher		healing process	1
7.	Krishna Hitesh	senior	hiteshgowda40	Morphology of	-
		teacher	5gmail.com	anatomy,	
				histology and	
				embriology	
8.	Ratbek	Candidate	sailaubekuly_r	Fundamentals of	Author of 45 international
	Saylaubekuly	of medical	@mail.ru	clinical	and republican scientific
		sciences		parasitology	publications
9.	Serikpaeva	Senior	Tomarajan62	Sanitary	Author of 37 scientific
	Tamarakhan	teacher	@mail.ru	microbiology	publications, 1 textbook
	Tyulkubaevna				
10.	Nuralieva Gulmira	Senior	Nuralieva70bk	Sanitary	Author of 15 scientific
	Nurpapaevna	teacher	<u>.ru</u>	microbiology	publications, 1 textbook
11.	Abdramanova	Senior	aigera 0@mail	The state of	Author of 15 scientific
	Aigerim	teacher	<u>.ru</u>	dysbacteriosis	publications, 2 textbooks
	Asylkhanovna			rheumatoid	
				arthritis	
12.	Polatbekova	Senior	p.shapagat@m	Fundamentals of	Author of 5 scientific
	Shapagat	teacher	<u>ail.ru</u>	clinical	publications, 4 textbooks
	Tolegenkyzy			parasitology	
13.	Odzyal Dayana	Senior	dayana_odzyal	The relevance of	Author of 5 scientific
	Eduardovna	teacher	<u>@mail.ru</u>	microbiology in	publications, 1 educational
				the modern world	benefits
14.	Serikpaeva	Senior	Tomarajan62	Sanitary	Author of 37 scientific
	Tamarakhan	Lecturer	@mail.ru	microbiology	publications, 1 textbook
l		1			· · · · · · · · · · · · · · · · · · ·

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	T 11 1	~ <i>j</i>	nabus		
	Tyulkubaevna				
15.	Daurenbekov K.N.	Head of Department, Candidate of Chemical Sciences, Acting professors	daurenbekov.k anat@mail.ru	1. «Study of medicinal plants used in folk medicine, growing in the flora of the Turkestan region» «Search and implementation of active teaching methods in teaching chemical disciplines»	Has 6 textbooks, over 130 - scientific and methodological publications, 12 teaching aids and the author of 6 standard programs
16.	Dildabekova L.A.	Acting	Lazzat_D@inb	«Search and	9-teaching aids, more than
		Associate	ox.ru	implementation of	75 scientific and
		Professor,		active teaching	methodological
		Candidate		methods in	publications.
		of		teaching chemical	
		Pedagogical Sciences		disciplines»	
17.	Rysymbetova	Master's	jansaya_1980	«Study of	3 teaching aids, more than
	Zh.K.	degree,	@mail.ru	medicinal plants	25 scientific and
		Senior		used in folk	methodological
		Lecturer		medicine,	publications.
				growing in the	
				flora of the	
				Turkestan region»	
18.	Kulbaeva M.S.	Master's	Mili_0907@m	«Study of	7 scientific publications
		degree,	<u>ail.ru</u>	medicinal plants	
		Lecturer		used in folk	
				medicine,	
				growing in the	
				flora of the	
10	77 11 N.C.	3.5	3.6'1' 00070	Turkestan region»	7
19.	Kulbaeva M.S.	Master's	Mili_0907@m	«Study of	7 scientific publications
		degree,	<u>ail.ru</u>	medicinal plants	
		Lecturer		used in folk medicine,	
				growing in the	
				flora of the	
				Turkestan region»	
	l	1	<u> </u>	Tarkestan region/	
7.	Thematic plan				

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W	Topic name	Synopsis	LO	Nu	Forms/methods/	Evaluation
ee k/ Da y	Тори паше		dis- cipli nes	mb er of ho urs	technologies of training	forms/ methods
1	Molecular biology of the cell Lecture №1 Topic. Molecular biology of the cell. Structure and functions of the main components of the cell. Transport of substances through biomembranes. Adhesive function of membranes. External signal transmission in the cell. Types of signaling pathways and signaling systems.	Structure of eukaryotic cell.Structure of cell surface apparatus: biomembranes, Mechanisms of intracellular transport of substances, passive and active transport. Passive and active transport. Ion channels and ion pumps. Families of adhesive membrane proteins. Adhesive function of membranes Basic stages of signal transduction.	LO1	1	Overview	Feedback
	Molecular biology of the cell Practical lesson No.1 Topic. Molecular biology of the cell. Structure and functions of the main cell components.	Structure of prokaryotic and eukaryotic cell. Structure, functions.	LO1	1	Small group work, discussion of key issues, presentation	Testing, oral and written questioning.
	Histology Practical lesson №1. Topic: Basic principles of manufacturing histological preparations.	The main stages of manufacturing a fixed and stained histological preparation.Principles of operation and use of special microscopy devices.	LO 11	2	Working in small groups, getting to know the work in the histolab	A checklist for evaluating a practical lesson.
	Chemistry Practical lesson No. 1. Topic: Chemistry in medicine. Chemical elements in the cells of living organisms.	Chemistry and human health. Topography of the most important elements in the human body. The elemental composition of the cell. The content of chemical elements in the human body. How chemistry affects the human body.	LO6	1	Working in small groups	Control of the initial level of knowledge / test control

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		Syllabus	1	1		
	Molecular biology of the cell IWLT.№1 Molecular structure of cells and diseases arising from their dysfunction.	organoids and their classification Diseases of lysosomes, peroxisomes, protein-sorting disorders in ER, mitochondrial diseases. Definition and mechanism of development.		1	Work in small group, presentation defense, glossary compilation.	Presentation , glossary, abstract
	Histology IWLT. Consultation on the implementation of the IWL 1. The task of the IWL №1 Microscopy. Histological technique.	The device of the microscope.  Principles of operation of the light and electron microscope.	LO1 1 LO1 2	1/2	Work in small groups, presentation protection, glossary compilation.	Checklist for the evaluation of IWS
	Chemistry IWLT/IWL Consultation on the implementation of the IWL 1. The task is IWL: Chemical bonding and its significance in human life.	formation. Covalent bond properties: saturation, directivity, polarizability. Types of covalent communication by the method of overlapping electronic clouds. Hydrogen bonding and its varieties. The biological role of hydrogen bonding.	LO5 LO6	1/2	Presentation	Oral
2	Histology Lecture. №1 Topic: Cytology.	The subject of the study of cytology, histology, its sections. Methods of research in cytology and histology.		1	Overview	Answers to security questions.
	Molecular biology of the cell Practical Lesson №2 Topic. Eukaryotic cell. Cell surface apparatus. Plasma membrane.	Cell surface apparatus. The supramembrane apparatus and submembrane layer of supporting and contractile structures. Membrane lipids	LO2	1	Discussions of key issues, video training, presentation	Testing, oral and written questioning.



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	Histology Practical lesson №2 Topic: Cytology. Membrane organelles and non-membrane organelles. Inclusions.	Cell definition. Biological membrane. Plasmolemma and its derivatives. Methods of penetration of substances into the cell. Types of non-cellular structures.	LO1 0	1	Work in small groups, checklist of histological preparations and microphotographs	A checklist for evaluating a practical lesson.
	Chemistry Practical lesson №2. Topic: Fundamentals of chemical thermodynamics.Relat ion of system parameters (temperature, internal energy, enthalpy, free energy, entropy,) with living matter. Thermochemical calculations.	Thermodynamics of biological processes. Bioenergetics. System. The concept of enthalpy. The doctrine of thermochemistry. Hess's law. Enthalpy changes in various chemical and physico-chemical processes. The second law of thermodynamics. Entropy. Gibbs free energy.	LO5	1	Work in small groups	Oral/test control
	Chemistry IWLT/IWL Consultation on the implementation of the SIW 1. The task is IWL: Thermodynamics of living systems.	Fundamentals of chemical thermodynamics. Thermodynamics of living systems. Exoergonic and endoergonic processes occurring in the human body.	LO4 LO5 LO6	1/2	Presentation	Oral
3	Chemistry Lecture №1. Topic: Introduction. Thermodynamics of biological processes. Basic concepts and laws of thermodynamics. Chemical kinetics and enzymatic catalysis.	The subject and tasks of chemistry. Chemical thermodynamics is the theoretical basis for the study of metabolism and energy. Laws of thermodynamics. The human cell as a complex thermodynamic system. Thermochemistry. Hess's law. Entropy. Gibbs energy.	LO5 LO6	1	overview/ computer technology	Feedback
	Chemistry Practical lesson №3. Topic: Chemical kinetics and its significance in medicine.	Kinetics of chemical reactions. Factors affecting the reaction rate. Prediction of chemical equilibrium displacement. Concepts of the kinetics of biological processes in living organisms.	LO4 LO5	1	Work in small groups, lab. work	Oral interview/pr oblem solving, protection of the result of

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		Syllabus				
						experiments .lab.works
	Chemistry IWLT/IWL	Enzymatic catalysis. The nature and classification of	LO4 LO5	1/1	Presentation	Oral interview
	Consultation on the	enzymes. Features of the	LO6			
	implementation of IWL 3. Task IWL	action of enzymes in living organisms. The importance of				
	Enzymatic catalysis.	enzymes in the processes of				
	Features of the action	metabolism of vital activity.				
	of enzymes.	26: 1: 1	1.00	1		72 11 1
4	Microbiology Lecture.	Microbiology as a fundamental and applied	LO9	1	Overview.	Feedback.
	General microbiology and virology.  Morphology of bacteria and viruses.	fundamental and applied science. Stages of development of microbiology. Nomenclature and classification of microorganisms. Concept of virion and virus. Morphological characteristics of the structure of bacterial cell virus.				
	Molecular biology of	Monolayer, bilayer and	LO2	1	Discussions of	Testing,
	the cell Practical Lesson №3	vesicles (liposomes and vesicles). Membrane proteins:	LOZ	1	key issues, video training,	oral and written
	Topic. Plasma membrane. Transport of	Peripheral and integral. Transport of high molecular weight compounds across			presentation	questioning.
	substances through membranes membranes: passive and active passive and active, vesicular.	membranes: endocytosis and exocytosis.				
	Histology	The concept of the cellular	LO1	1	Work in small	A checklist
	Practical lesson. №3	conveyor. Classification of	1		groups, checklist	for
	Topic: Cytology. The	organelles based on their	LO1		of histological	evaluating a
	core organelles. Inclusions	structure. Classification of inclusions.	2		preparations and microphotographs	practical lesson.
	Chemistry	Concentration of solutions	LO4	1	Work in small	Solving Solving
	Practical lesson №4.	and methods of their	LO5		groups, lab. work	tasks,
	Topic: Solutions. The value	expression. Preparation of solutions of a given	LO6			protecting
	of solutions in the	solutions of a given concentration. The				the result of lab
	vital activity of	importance of solutions in				experiments
	organisms.	medicine, biology and practical human activity.				.works

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,	1	Syndods		1	<u> </u>	,
M	<b>Iicrobiology</b>	Morphological features of	LO7	1	Test conversation,	Check list.
P	ractical lesson.	bacteria. Classification of	LO8		performing	
G	General microbiology	taxonomy of microorganisms.			laboratory work.	
1	nd virology.	Microscopic research method				
	Morphology of	in microbiology. Smear				
	1 00	•				
	acteria. Microscopic	preparation technique. Simple				
	xamination method.	painting methods.				
$\mathbf{M}$	Iolecular biology of	Membrane organelles of the	LO2	1	Small group	Presentation
th	ne cell	cell. Structure and functions:			work,	, glossary,
I	<b>WLT.№2</b> Molecular	mitochondria, Golgi complex.			presentation	abstract
st	tructure and function	Three-dimensional model of			defense, glossary	
of		Golgi complex dictyosome.			compilation.	
	rganelles.	ER.			• • • • • • • • • • • • • • • • • • •	
	Tistology	Identify the core structures at	LO1	1/2	Work in small	Checklist
		•		1/2		
	WLT. Consultation	the micro and	1		groups,	for the
Ol		ultramicroscopic level. The			presentation	evaluation
	nplementation of	structure of the nucleus in the			protection,	of IWS
th	ne IWL 1. The task	interphase. The role of the			glossary	
of	f IWLT №2	nucleus in protein synthesis.			compilation.	
N	lucleus	-			_	
C	hemistry	Water, the structure of the	LO4	1/2	Presentation	Oral
	WLT/IWL	molecule.	LO5			interview
1	Consultation on the		LO6			inter view
	nplementation of	non-pyrogenic water. The	LOU			
		1.				
	WL 4. Task IWL	importance of water for the				
	Vater. Chemical	vital activity of organisms.				
	eactions in an					
	queous solution. The					
bi	iological role of					
W	ater in a living					
OI	rganism.					
	<b>licrobiology</b>	The role of medical	LO8	1	Presentation,	Criterion
	WLT.	microbiology in the progress			essay.	assessment.
	Medical microbiology	of medicine. Goals and			cosay.	assessificite.
	nd its role in					
	nedicine.					
		virology and immunology in				
	Organization and rules	their historical development.				
of	1	The importance of these				
	nicrobiological and	disciplines in the practical				
	irological	activities of a doctor.				
la	boratories.	Equipment and rules of work				
		in a microbiological				
		laboratory. Methods for				
		microbiological diagnosis of				
		bacterial and viral infections.				
		1				
		bacterioscopic research				

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SOUTH KAZAKHSTAN MEDICAL ACADEMY АО «Южно-Казахстанская медицинская академия»

**АКАDEMIASY** «Оңтүстік Қазақстан медицина академиясы» АҚ Department of «Biology and Biochemistry», «Chemical disciplines», «Microbiology, virology and immunology», «Pathological anatomy and

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histology»

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			method and its use for laboratory diagnostics. The importance of the bacteriological research method.				
	5	Molecular biology of the cell Lecture №2 Topic. Molecular biology of the cell. Adhesive function of membranes. External signal transduction in the cell.	Families of adhesive membrane proteins. Adhesive function of membranes. Basic stages of signal transduction. Types of signaling pathways and signaling systems.	LO1	1	Overview	Feedback
		Molecular biology of the cell Practical lesson №5. Topic. Structure and work of ion channels and pumps.	Ion channels and ion pumps. Uniport, symporti antiport. Na+, K+ pump. Apoptosis.	LO3	1	Discussions of key issues, video training, presentation	Testing, oral and written questioning.
		Histology Practical lesson. №4 Topic: Cell division. Cell cycle.	Characteristics of the cell life cycle. Mitosis. Endomitosis. Endoreproduction. Polyploidy.	LO1 0 LO1 2	1	Характеристики жизненного цикла клетки. Митоз. Эндомитоз. Производство Андреа. Полиплоидия.	A checklist for evaluating a practical lesson.
		Chemistry Practical lesson №5. Topic: Colligative properties of solutions. The role of osmosis in biological processes.	Osmosis. Osmosis in blood cells. Van't-Hoff's law. Plasmolysis, hemolysis, turgor and isotonicity. Classification of solutions for injection (hypotonic, hypertonic and isotonic solutions). Preparation of physiological solutions.	LO4 LO5 LO6	1	Work in small groups, lab. work	Oral interview / test control, protection of the result of lab experiments .works'
		Molecular biology of the cell IWLT.No.3 Molecular structure and function of cell membrane organelles.	Membrane organelles of the cell. Structure and functions: mitochondria, Golgi complex. Three-dimensional model of Golgi complex dictyosome. ER.	LO4	1	Small group work, presentation defense, glossary compilation.	Presentation , glossary, abstract
		Histology IWLT. Consultation on the implementation of	A set of signs of vital activity of cells. The reaction of cells to damage. Morphological signs of apoptosis and	LO1 1	1/2	Work in small groups, presentation protection,	Checklist for the evaluation of IWS

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SOUTH KAZAKHSTAN
MEDICAL

АСАDEMY АО «Южно-Казахстанская медицинская академия»

«Оңтүстік Қазақстан медицина академиясы» АҚ

Department of «Biology and Biochemistry», «Chemical disciplines»,
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histology»

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		Syllabus				
	the IWL 1. The task of the IWL No3 Cytology. The reaction of cells to damaging effects. Aging and cell death.	necrosis.			glossary compilation.	
	Chemistry IWLT/IWL Consultation on the implementation of IWL 5. The task of IWL is the value of solutions in the vital activity of organisms. Electrolytes in a living organism.	Types of solutions. Solubility.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.	LO4 LO5	1/2	Presentation	Oral interview
6	Histology Lecture. №2 Topic: Fundamentals of the doctrine of tissues.	Laws of origin and evolution of tissues. Classification of tissues. Mechanisms of tissue homeostasis. Limits of tissue variability. Epithelial tissue. Connective tissue.	LO1 2	1	Overview	Answers to control questions.
	Molecular biology of the cell Practical lesson №5. Topic. Structure and function of cellular non-membrane organelles and the cell cytoskeleton.	functions of cellular non- membrane organelles. Cell center, ribosome, cilia and	LO3	1	Discussions of key issues, video training, presentation	Testing, oral and written questioning.
	Histology Practical lesson. №5 Topic: Epithelial tissue. Glands.	Morphofunctional and histogenetic epithelial features. Classification. The structure of various types of epithelium. Glands. Histophysiology of the secretory process. Types of secretion.	LO1 0 LO1 2	1	Work in small groups, checklist of histological preparations and microphotographs	A checklist for evaluating a practical lesson.
	ChemistryPractical lesson №6.Topic:The acid-base	Acid-base theories by Arrhenius and Brensted- Lowry. The degree and constant of	LO4 LO5 LO6	1	Work in small groups of labs. work.	Oral interview / test control, protection

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MEDICAL ACADEMY АО «Южно-Казахстанская медицинская академия» **АКАDEMIASY** «Оңтүстік Қазақстан медицина академиясы» АҚ Department of «Biology and Biochemistry», «Chemical disciplines»,

«Microbiology, virology and immunology», «Pathological anatomy and histology»

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Notrobiology   Notrobiology and structure of Practical lesson. Bacterial cell structure.   Immersion microscopy method.   LO8   LO9   Immersion microscopy method.   LO9   Immersion microscopy method.   LO5   Immersion microscopy method.   LO5   Immersion microscopy method.   LO5   Immersion microscopy method.   LO4   I/2   Presentation   Oral interview   Immersion microscopy method.   LO5   I/O5		1	, ,				-
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Practical lesson   Bacteria   Complex painting   tructure.   Immersion   methods.   Gram   stain.   Tructure.   Immersion   microscopy   method.   Types of violations of acid-base   balance.   Types of violations of acid-base   balance.   Homeostasis.   Microbiology   IWLT/IWL   Morphology   and physiology of fungi and protozoa.   Morphology and physiology of fungi and protozoa.   The solution as the basis of Lecture Ne2. Topic: The doctrine of solutions. Osmosis in biological   systems.   Buffer systems.   Buffer systems.   Buffer systems.   Molecular biology of the cell   Molecular biology of the cell   Structure and functions   Momentane organelles of the cell   LO3   LO3   Discussions of Testing, we will be presented in the practical session   LO4   LO4   LO5   LO6   LO6   LO6   LO5   LO6   LO		•					
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Morphology and physiology and physiology and physiology of fungi and protozoa.   The solutions and physiological systems.   Buffer systems.   Buffer systems.   Buffer systems.   Molecular biology of the cell   Types of violations of a cid-base balance.   Types of protozoa in a lakalosis.   Homeostasis.   LO6   LO5   LO6   LO6   Molecular biology of tungi and protozoa.   LO9						laboratory work.	
Chemistry   Types of violations of acid-base balance. Types of IWLT/IWL   LOS acidosis and alkalosis. LO6   IWL Violation of IWL Violation of acid-base balance. Homeostasis. Violations of IWL JUDIATION   Homeostasis. Violations of the acid balance of the blood.   LO9   IWLT/IWL		structure.	1				*
IWLT/IWL   base balance. Types of acidosis and alkalosis. IUO6   IWL 6. The task of IWL Violation of acid-base balance. Homeostasis. Violations of IWLT/IWL.   Morphology and physiology of fungi and protozoa.   Classification of mushrooms.   Morphology and physiology of fungi and protozoa.   Types of protozoa that cause human diseases. Methods for diagnosing protozoal infections.   Resistance of fungi to environmental factors.   Pathogenic fungi. Mycoses.   The solution as the basis of solutions. Osmosis in biological systems.   Buffer systems.   Buffer systems.   Buffer systems.   Buffer systems.   Buffer systems.   Buffer systems   Biological functions of buffer systems   Biological functions of the cell   Structure and functions   LO3   Lo6   LO6   LO6   LO6   LO6   LO7							session
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IWLT/IWL.       Morphology and physiology of fungi and protozoa.       Morphology and physiology of fungi and protozoa.       presentation.       assessment         Amorphology of fungi and protozoa.       Types of protozoa that cause human diseases. Methods for diagnosing protozoal infections.       Resistance of fungi to environmental factors. Pathogenic fungi. Mycoses.         7       Chemistry       The solution as the basis of the vital activity of the cells. The doctrine of solutions. Osmosis in biological systems. Buffer systems.       The solution as the basis of the twital activity of the cells technology       LO5       Lo6       Lo6       Computer technology       Feedback         Sultions. Osmosis in biological systems. Buffer systems.       Ebuliometry. Cryometry. Osmosis. Osmosis in blood cells. Van't-Hoff's law. Plasmolysis, hemolysis, turgor and isotonicity. Hypertonic and hypotonic solutions. Buffer systems. Biological functions of buffer systems in living organisms.       Biological functions of buffer systems in living organisms.       LO3       1       Discussions of Key issues, video       Testing, oral at the cell. Structure and functions			Classification of mushrooms	1 00	2/1	Abstract	Critorion
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		Practical lesson №6.	, ,			training,	written
Topic. Molecular complex. Three-dimensional presentation questioning	IL	<b>Topic.</b> Molecular	complex. Three-dimensional			presentation	questioning.

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		Syllabus				
	structure and function of cell membrane organelles and the nucleus.  Histology	model of Golgi complex, ER. Nuclear apparatus of the cell, structural organization of chromatin, karyoplasm. Morphofunctional	LO1		Work in small	A checklist
	Practical lesson. No6 Topic: The blood and lymph.	characteristics of blood as tissue. Morphology and function of shaped blood elements. The composition of the lymph.	0 LO1 1		groups, checklist of histological preparations and microphotographs	for evaluating a practical lesson.
	Chemistry Practical lesson №7. Subject: Buffer systems. The importance of buffer systems in the human body	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	LO5 LO6	1	Work in small groups	Oral interview/so lving tasks
	Molecular biology of the cell IWLT/IWL №4 Consultation on the implementation of the MC. Midterm control №1.	Control over the assimilation of theoretical knowledge and practical skills on the topics covered in lectures and practical classes	LO2	1		Testing, solving situational problems, oral questioning. Evaluation of test results, situational tasks.
	Histology IWLT. Consultation on the implementation of the IWL 1. The task of the IWL №4 Embryonic hematopoiesis.	Features of embryonic hematopoiesis and its main stages.	LO1 2	1/2	Work in small groups, presentation protection, glossary compilation.	Checklist for the evaluation of IWS
8	Microbiology Lecture. Physiology and biochemistry of bacteria and viruses.	Metabolism of bacteria and viruses. Respiration and nutrition of bacteria. Bacterial cultivation. Isolation and indication of viruses.		1	Overview.	Feedback .
	Molecular biology of the cell Practical lesson №7. Topic. Intercellular	Intercellular contacts: simple connection, interdigitation, adhesive belt. Tight junctions: nexus or slit-like	LO3	1	Discussions of the main issues, video training, presentation	Testing, oral and written questioning.

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interactions. Contacts.	junctions.				
Histology	Principles of classification of	LO1	1	Work in small	A checklist
Practical lesson №7.	connective tissues. Cellular	0		groups,	for the
Topic: Loose	elements of RAST and their	LO1		presentation	evaluation
unformed fibrous	function. Varieties of	1		protection,	of the
connective tissue.	connective tissue fibers.			glossary	practical
Dense connective	Chemical composition,			compilation.	exercise.
tissue. Connective	function and origin of the				
tissues with special	basic amorphous substance.				
properties.					
- CI	**	T 0.5			
Chemistry	Hydrolysis of salts. Types of	LO5	1	working in small	Oral
Practical lesson №8.				groups	interview/
Topic: Hydrolysis.	' '				test control
Hydrolysis of salts.					
Biological role of					
hydrolysis in the	1				
processes of vital	activity of the body				
activity of the					
organism	NT 1111	1.00	1	C 11	A 1 11' .
Microbiology	Nutrition, respiration, growth	LO8	1	Small group	A checklist
Practical lesson.	and reproduction of bacteria.	LO9		work, performing	for the
Physiology and	Methods for isolating pure			laboratory work.	evaluation
biochemistry of					of the
bacteria.	anaerobic bacteria and				practical
Microbiological	methods for identifying pure				exercise.
research method.	cultures of bacteria used in				
	the bacteriological diagnosis of infectious diseases.				
	Preparation of nutrient media				
	for cultivation, inoculation of microorganisms.				
Molecular biology of		LO2	1	Small group	Presentation
the cell	regulatory molecules. Cyclin-	102	1	work, laboratory	, glossary,
IWLT. №5	dependent protein kinases and			work, laboratory work.	abstract
Molecular	their function. Cyclins and			WOIK.	aostract
mechanisms of cell	their function. Cyclins and their function.				
cycle regulation.	then function.				
Histology	To summarize the results of	LO1	1/	1. The ability to	Diagnostics
IWLT/IWL5.	the development of	0	2	determine	of
Midterm control- 1	theoretical and practical	LO1	~	histological	microphoto
TVIIGICI III COIIII OI- I	material.	2		preparations.	graphs and
	11141011411.	_		2. The ability to	microprepar
				fill out a checklist	ations
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				and	evaluation
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		Syllabus				
					microphotographs	of MC).
	Chemistry IWLT/IWL Consultation on the implementation of MC 1. Midterm control No. 1	Control of the assimilation of theoretical knowledge and practical skills on the topics of lectures, practical classes and SIW (1-7 topics).	LO5	1/2	Oral and written survey on tickets or comp.testing	Oral and written survey
	Microbiology IWLT/IWL. Midterm control No. 1		LO7 LO8	1/3	Colloquium	Oral questioning (tickets)
9	Molecular biology of the cell Lecture №3 Topic. Molecular structure of cells and diseases arising from disruption of their function.	Definition of the concept of organoids and their classification. Diseases of lysosomes, peroxisomes, protein-sorting disorders in ER, mitochondrial diseases. Definition and mechanism of development.	LO1	1	Overview	Answers to control questions.
	Molecular biology of the cell Practical lesson №8 Topic. Adhesive function of membranes. Transmission of external signal into the cell.	General idea of the mechanism of intercellular interaction. Families of adhesive membrane proteins. Adhesive function of membranes. Types of signaling pathways Basic stages of signal transmission in the cell. Characteristics of signaling molecules. Secondary messengers	LO3	1	Discussions of key issues, video training, presentation	Testing oral and written questioning.
	Histology Practical lesson №8. Connective tissues with special properties.	Reticular connective tissue. Pigmented, white and brown adipose tissue, mucous tissue. Location, functional value.	LO1 0 LO1 2	1	Work in small groups, presentation protection, glossary compilation.	Checklist for the evaluation of practical exercises
	Chemistry Practical lesson №9. Topic: Biogenic s-, p-, d- elements and their significance for living organisms.	Classification of chemical elements. The location of s-, p-, 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.	LO5 LO6	1	Work in small groups	Oral interview/ test control



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		Synabus	•			
	Chemistry	Biogenic elements are non-	LO4	1/2	Presentation	Oral
	IWLT/IWL	metals that are part of the	LO5			interview
	Consultation on the	human body.				
	implementation of	Biogenic elements are metals				
	IWL 8. IWL task	that are part of the human				
	Biogenic elements in	body.				
	the human body.	The elementary composition				
		of the human body.				
		The content and biological				
		role of chemical elements in				
		the human body.				
10	Chemistry	Surface energy and surface	LO4	1	overview/	Feedback
	Lecture №3. Topic:	tension. Adsorption.	LO6		computer	
	The importance of	Surfactant The role of	200		technology	
	surface phenomena in	adsorption in biology and			teemology	
	medicine.	medicine.				
		medicine.				
	Adsorption.	TD 1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1.01	1	XX7 1 ' ''	C1 111
	Histology	To determine the varieties of		1	Work in small	Checklist
	Practical lesson. №9.	cartilaginous tissues by the	1		groups,	for the
	Topic:Cartilaginous	structural features of the	LO1		presentation	evaluation
	tissue	intercellular substance and to	2		protection,	of practical
		know the histofunctional			glossary	exercises.
		features.			compilation.	
	Chemistry	The structure of complex	LO4	1	work in small	Oral
	Practical lesson №10.	compounds. Nomenclature	LO5		groups, laboratory	interview /
	Topic:	and types of complex	LO6		work	test control,
	Complex compounds	compounds.Chemical	200		,, 0111	protection
	and their properties.	bonding in complex				of the result
	The medico -	compounds. Equilibrium in				of lab
		solutions and dissociation of				
	biological role of					experiments
	complex compounds.	complex compounds.	1.01	1	D . 1.1	,works
	Microbiology	Virus cultivation methods.		1	Extended	Check list
	Practical lesson.	Virus identification	0		conversation.	for the
	Physiology of viruses.	indication. Phages and phage				evaluation
	Virological research	typing. Stages of preparing a				of practical
	methods.	single-layer cell culture.				exercises.
		Techniques for infection with				
		viruses and dissection of a				
		chicken embryo, methods for				
		isolating phages from an				
		environmental object and				
		their identification.				
	Mologular biology of		LO3	1	Discussions of	Tosting oral
	Molecular biology of	Cell cycle. Periods of the cell	LUS	1		Testing oral
	the cell	cycle. Direct and indirect cell			key issues, video	and written
	Practical lesson No9	division. Mitosis. Typical and			training,	questioning.
	Topic.	atypical mitosis. Phases of			presentation	
1	The cell cycle.	mitosis. Similarity and				

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	Syllabus					
Mitosis. Meiosis.	difference of mitosis and meiosis. Stages I prophase of meiotic division.					
Molecular biology of the cell IWLT. No6 Transport of substances through membranes: transmembrane transport of low molecular weight substances of low molecular weight substances.	Transmembrane transport of low-molecular substances and ions. Membrane transport of substances in the direction of their movement.  Passive transport of substances and ions. Types of ion channels and ion pumps.	LO3	1	-	group	Presentation ,glossary, abstract
Histology IWLT/IWL №6 Bone tissue.	Distinguish lamellar bone tissue from Coarse fiber and know their histofunctional features.	LO1 0	1/2	groups, presentation protection, glossary compilation.	small	Checklist for the evaluation of IWS.
Chemistry IWLT/IWL Consultation on the implementation of IWL 9. IWL task The biological role of complex compounds. Biocomplexes. Understanding of the structure of metalloenzymes (hemoglobin, chlorophyll) and their biological role.	The biological role of complex compounds in the human body. Representations and biocomplexes. The structure of hemoglobin, chlorophyll, vitamin B12 (cyanocobalamin) and their biological role.	LO4 LO5	1/2	Presentation		Oral questioning
Microbiology IWLT/IWL. Concept of biotechnology. Microorganisms involved in biotechnological processes. Biological preparations obtained by genetic engineering.Features	Biotechnology. A brief history of the development of biotechnology. Processes used in biotechnology. Genetic engineering. Genetics of bacteria and viruses. Microorganisms, cells and processes used in genetic engineering.	LO8	1/2	Abstract, presentation, assay of topic		Criterion assessment.

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		Synabus				
	of chemotherapy for viral infections.					
11	Histology Lecture. №3 Topic: Muscle tissue. Nervous tissue.	The structure of muscle tissue. Nerve cells and neuroglia. Nerve fibers, nerve endings, synapses.	LO1 0	1	Overview	Answers to security questions.
	Molecular biology of the cell Practical lesson №10 Topic. Molecular mechanisms of apoptosis and oncogenesis. Carcinogenesis.	General idea of the mechanism of apoptosis and necrosis. Definition of the concept of carcinogenesis.	LO2	1	Discussions of key issues, video training, presentation	Testing, oral and written questioning.
	Histology Practical lesson. №10 Topic: Muscle tissue.	Morphofunctional characteristics of muscle tissues. Smooth and striated muscle tissue. Structural differences in the organization of slow and fast muscle fibers.	LO1 1 LO1 2	1	Work in small groups, checklist of histological preparations and microphotographs	A checklist for evaluating a practical lesson.
	Chemistry Practical lesson №11. 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.	LO5 LO6	1	Work in small groups	Oral interview/ test control
	Microbiology Practical lesson. Genetics of bacteria and viruses. Genotypic and phenotypic variability of microorganisms.	Genotypic and phenotypic variability of microorganisms. Plasmids. Practical meaning of variability. Essence, goals and objectives of biotechnology.  Microorganisms and processes used in biotechnology. Genetic engineering and its application in biotechnology. Genetic recombinations in bacteria in experiments of		1	Extended conversation.	A checklist for the evaluation of the practical exercise.

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	5 y Habas			<u> </u>	
	transformation, transduction and conjugation. Genotyping.				
Molecular biology of the cell IWLT. №7 The cell cycle. Mitosis. Atypical mitosis and its causes.	Cell cycle periods G1, S, G2, M, G0, characterization and content of the periods.	LO3	1	Work in small groups, defence of the presentation, compilation of a glossary.	Presentation , glossary, abstract
Histology IWLT/IWL №7 Regeneration of skeletal muscle tissue	Mechanisms of regeneration of skeletal muscle tissue, its structural features depending on the age of a person.	LO1 2	1/2	Work in small groups, presentation protection, glossary compilation.	Checklist for the evaluation of IWS
Chemistry IWLT/IWL Consultation on the implementation of IWL 10. IWL task Potentiometry in medical practice.	Potentiometry. The use of potentiometry methods in clinical analysis and in the practice of sanitary and hygienic research. Determination of the concentration of physiologically active ions in biological fluids and tissues using potentiometric methods	LO4 LO6	1/2	Presentation	Oral questioning
Microbiology IWLT/IWL. Characteristics of the infectious process.	Biological research methods widely used in the diagnosis of infectious diseases and scientific experiments.  Pathogenicity of microorganisms as a polydeterminate trait.  Virulence, units of its measurement. Pathogenicity properties. Chemical nature, basic properties of exotoxins.  Basic properties and chemical nature of endotoxins. Forms of infection and their characteristics. Periods of infectious disease. Main sources of infection. Routes and methods of infection. List and characterize the infectious properties of viruses, features of viral infections.	LO9	1	Abstract, presentation, essay on the topic .	Criterion assessment.

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		Syllabus				
1	Chemistry Lecture №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 preparation and purification of 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.	LO5 LO6	1	overview/ computer technology	Feedback
	Molecular biology of the cell Practical lesson №11 Topic. The cell cycle and molecular mechanisms of its regulation. <a href="https://www.youtube.com/watch?v=U053VjkuFaY&amp;feature=youtu.be">https://www.youtube.com/watch?v=U053VjkuFaY&amp;feature=youtu.be</a>	The cell cycle. Cyclins and cyclin Cyclins and cyclin-dependent kinases (CDK), mitosis stimulating factor (MSF). Cell cycle control points. Regulatory role of p-53 proteins.	LO3	1	Discussions of key issues, video training, presentation	Testing, oral and written questioning.
	Histology Practical lesson. №11 Topic: Nervous tissue. Neurocytes. Neuroglia.	Identify different types of neurocytes. To explain the cytological features of nerve cells, neuroglia at the microscopic and ultramicroscopic levels.	0 LO1 1	1	Определите различные типы нейроцитов. Объяснить цитологические особенности нервных клеток, нейроглии на микроскопическ ом и ультрамикроско пическом уровнях.	A checklist for evaluating a practical lesson.
	Chemistry Practical lesson №12. Topic: Surface phenomena at the interface of phases. Biological	Surface energy and surface tension.  The concept of sorption, adsorption, absorption.  Adsorption at the interface of phases, factors affecting	LO5 LO6	1	Work in small groups	Oral interview/ test control

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		Syllabus						
	significance of adsorption processes. Adsorption therapy.  Microbiology Practical lesson. Drug resistance of bacteria. determination of bacterial sensitivity to antibiotics.	adsorption. Surfactants and surfactants. The Duclos-Traube rule. Types of adsorbents. Selective adsorption. The Paneta Faience rule. Adsorption therapy. The role of surfactants in medicine.  Primary and acquired resistance of microorganisms to chemotherapeutic drugs. Ways to overcome drug resistance in bacteria. Quantitative and qualitative determination of bacterial sensitivity to antibiotics.	LO8 LO9	1	Test comperforming laborator Testing.	_	Practica exercise evaluati checklis	ion
	Molecular biology of the cell  IWLT No.8 The cell cytoskeleton and motor organelles of the cell.	Define the concept of cytoskeleton and motor organelles of the cell.		1	work.	group aboratory	Presenta , glos abstract	sary,
	Histology IWLT/IWL № 8 Nerve endings.	The concept of nerve endings and their classification. The structure of sensory and motor nerve endings.	LO1 0	1/2	Work in groups, presentate protection glossary compilate	ion n, ion.	Checkli for evaluati of IWS	the
	Microbiology IWLT/IWL. Midterm control №2	Control of mastering of theoretical knowledge and practical skills on the passed topics of lectures, practical classes		1/3	Colloqui		Oral Questio (tickets)	
13	Molecular biology of the cell Practical lesson №12 Topic. The cell cycle and molecular mechanisms of its regulation.https://www.youtube.com/watch?v=U053VjkuFaY&feature=youtu.be	The cell cycle. Cyclins and cyclin Cyclins and cyclin-dependent kinases (CDK), mitosis stimulating factor (MSF). Cell cycle control points. Regulatory role of p-53 proteins	LO3	1	Discussion key issue training, presentat	es, video	Testing oral written question	and

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Histology Practical lesson №12. Topic: Nervous tissue. Nerve fiber. Nerve ending. Synapses.		LO1 0 LO1 2	1	Work in small groups, checklist of histological preparations and microphotographs	A checklist for evaluating a practical lesson.
Chemistry Practical lesson №13. Topic: Colloidal-dispersed system. Nature, classification of colloidal systems. Properties of dispersed systems.	medium. Classification of dispersed systems. The structure of the micelle. Methods of preparation and purification of colloidal	LO5 LO6	1	Work in small groups	Oral interview/ test control
Microbiology Practical lesson. Ecology of microorganisms. Microflora of various organs and systems of the human body.	Distribution of microbes in the environment. Concepts normal to the human microflora. Microflora of various organs and systems of	LO7 LO8	1	Discussion, essay.	checklist practical session evaluation
Molecular biology of the cell IWLT/IWL №9 Consultation on the implementation of the MC. Midterm control №2.	Control over the assimilation of theoretical knowledge and practical skills on the topics covered in lectures and practical classes	LO2	1	Oral and written questioning, testing	Testing, solving situational problems, oral questioning. Evaluation of test results, situational tasks. tasks.
Histology IWLT / IWL №9	To summarize the results of the development of	LO1 1	1/0 ,5	1. The ability to determine	Diagnostics of

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	Chemistry IWLT/IWL Consultation on the implementation of IWL 11. IWL task Chromatography and its application in	theoretical and practical material.  Chromatography. The use of chromatography for the preparation and analysis of medicinal substances.	LO1 2 LO4 LO5	1/1	histological preparations.  2. The ability to fill out a checklist of histopreparations and microphotographs  Presentation	microphoto graphs and microprepar ations (checklist for evaluation of MC).  Oral interview
14	medical practice.  Chemistry  Practical lesson №14.  Topic: Stability and coagulation of colloidal systems.  Coagulation and peptization of sols.  Sedimentation analysis.	Coagulation of colloidal systems, its medical and biological significance. The Schulze-Hardy rule. Aerosols, suspensions, powders, emulsions and their properties.	LO4	2	Work in small groups	Oral interview/ test control
	Microbiology Practical lesson. Infection, infectious process. Biological research method.	Infection, infectious process, infectious disease. Forms of infection and their characteristics. Periods of infectious disease. The nature of the relationship between micro- and macroorganisms. Forms and stages of the infectious process. Characteristic features of infectious diseases. Pathogenicity, virulence, toxigenicity of bacteria. Methods of experimental infection and immunization of animals. Biological methods for studying pathogenicity and virulence factors, as well as methods for determining the virulence of bacteria and the activity of	LO7 LO9	1	Discussion.	Practical exercise evaluation checklist

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15 Chemistry Practical lesson №15. Topic: Highly Molecular Compounds. Viscosity of HMC solutions. Swelling.		Features of HMC solutions. Properties of high-molecular compounds. Swelling. Factors affecting swelling, biological significance of swelling. Salting, hardening. Syneresis.	LO4	1	Work in small groups	Oral interview/ test control
	Microbiology Practical exercise.			1		
	Chemistry IWLT/IWL Consultation on the implementation of MC 2. Midterm control-2	1 -	LO7	1/2	Oral and written ticket survey or comp. testing	Oral and written survey

	T				1	
9.	Teaching and learn	ng methods				
9.1	Lectures	Overview, video tr	raining, pre	sentation		
		With distance lear	rning, on-li	ne lectures are held	in the form	n of demonstration
		presentations on t	the Zoom a	and Webex platform	n. For feed	lback, students a
		provided to ask qu	estions on t	the topic.		
9.2	Practical lesson	- work in small gro	oups, discus	ssion of the main issu	ues, present	ation
		- work in small gro	oups, perfor	mance of laboratory	works.	
		- work in small	ll groups,	check list of h	istological	preparations an
		microphotographs				
9.3	IWL∖IWLT	- presentation, glos	ssary, abstr	act. Discussion and e	evaluation o	of SIW.
		- presentation				
		- abstract, presenta	ation, essay	on the topic		
		- work in small gro		ntation defense,		
		-composition of a	glossary.			
9.4	Midterm	0	tuational ta	asks, oral questionir	ıg. Evaluat	ion of test result
	examination	situational tasks.				
				g on tickets or compu		•
		_		raphs and microdrug	gs (check-li	st for evaluation
		the midterm exami	ination).			
10.	<b>Evaluation criteria</b>					
10.1	Criteria for assessi	g the learning out	comes of th	e discipline		

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No	Name	Unsatisfactory	Satisfactory	Good	Excellent
LO	learning outcomes	•	·		
LO	Demonstrates	1) Does not describe	1)Describes the	1)Applies	1) Evaluates
1	knowledge and	the structure of the	structure of the	knowledge of cell	the possibility
	understanding of	cell and the	cell and cell	structure using	of using
	cell structure and	components of the	components	the karyotyping	pathological
	cell components	cell	2)Understands the	method	changes in the
		2) Does not	mechanisms of	2)Interprets the	hereditary
		understand the	cell components	regularities of	apparatus to
		mechanisms of cell		cellular theory	diagnose
		components			diseases by
					cytological
					method and
					molecular
					genetic
					analysis.
					2) Compares
					changes in the
					karyotype of
					patients with
					clinical
					manifestations
					of hereditary
					diseases.
					3) Analyzes
					patterns of
					morphological
					changes in
					various
					hereditary
1.0	<b>.</b>	1) 0	5	1) 7 1 1 1	diseases.
LO	Demonstrates	1)Cannot unravel the	Does not fully	1)Explains the	1) Applies
2	knowledge and	etiology,	explain the	etiology,	knowledge of
	understanding of	pathogenesis and	etiology,	pathogenesis,	etiology,
	destructive changes	morphogenesis of	pathogenesis,	morphogenesis of	pathogenesis,
	in cellular	various cellular	morphogenesis of	various cellular	and
	components	diseases	various cellular	diseases	morphogenesis of various
	leading to disease		diseases		cellular
					diseases to
					diagnose
					hereditary
					diseases.
LO	Demonstrates	1) Cannot define	1) Makes	1)Describes	1)
3	knowledge of the	mitochondrial,	inaccuracies in	classifications of	Independently
	origins and	lysosomal,	the description of	mitochondrial,	describes the
	classifications of	peroxisomal diseases	mitochondrial,	lysosomal,	classifications
	Ciassifications of	peroxisornal diseases	mitocholiuriai,	rysosomai,	Classifications

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	mitochondrial,	2) Cannot	lysosomal,	peroxisomal	of
	lysosomal,	distinguish between	peroxisomal	diseases	mitochondrial,
	peroxisomal	changes in the	diseases. 2)	2)Distinguishes	lysosomal,
	diseases	hereditary apparatus	Poorly	well between	peroxisomal
		in various	distinguishes	different	disease
		mitochondrial,	between	mitochondrial,	2) Provides
		lysosomal,	classifications of	lysosomal,	differential
		peroxisomal diseases	mitochondrial,	peroxisomal	diagnosis for
			lysosomal,	diseases	mitochondrial,
			peroxisomal		lysosomal,
			diseases		peroxisomal
					disease
LC	-demonstrates	-is not oriented to	- is not clearly	- competently,	-logically,
4	knowledge of	theories, concepts,	oriented in	oriented in	clearly,
	chemical processes	and directions on the	theories, concepts	theories, concepts	competently,
	(basic types of	topic, does not	and directions on	and trends on the	oriented in
	reactions) in the	demonstrate	the topic, weakly	topic,	theories,
	body, obeying the	knowledge, and does	demonstrates	demonstrates	concepts and
	general laws and	not answer	his/her	his/her	directions on
	laws of chemistry,	questions.	knowledge,	knowledge,	the topic,
	as well as general		answers questions	answers questions	demonstrates
	energy and kinetic		with fundamental	with non-	his knowledge,
	laws of chemical		errors.	principled errors.	answers all
	processes;				questions. Also
					logically and
					competently
					answers
					additional
					questions.
LC		- doesn't know the	doesn't clearly	does not clearly	clearly knows
5	of calculation	calculation formulas	know the	know the	the calculation
	formulas (mass	for ways	calculation	calculation	formulas for
	fraction, molar	for expressing the	formulas for ways	formulas of the	expressing
	concentration,	concentration of	to express the	ways	concentration
	molar	solutions. Does not	concentration of	to express the	of solutions.
	concentration,	know how to choose	solutions.	concentration of	Logical
	molar	formulas when	Poor reasoning in	solutions.	correctly
	concentration of	preparing solutions.	the choice of	Poor reasoning in	reasoning in
	equivalent, molar	Does not know how	formulas for	the choice of	the choice of
	concentration,	to draw conclusions	preparing	formulas when	formulas in the
	molar fraction,	about the	solutions. And	preparing	preparation of
	titer) in preparation	quantitative content	does not know	solutions. And	solutions. And
	of solutions of	of substances in	how to draw	does not know	is able to draw
	given	liquids under study.	conclusions about	how to draw	conclusions
	concentrations and understands the		the quantitative content of	conclusions about	about the
				the quantitative	quantitative
	methods of		substances in the	content of	content of

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	1	Syllabus			
	determining the		liquids under	substances in the	substances in
	quantitative content		study.	liquids under	the liquids
	of substances in the			study.	under study.
	systems under study, including				
	biological fluids.				
LO	Formulates general	is not orientated in	is not competent,	answers the	logically,
6	theoretical	the general	orientated in the	teacher's	clearly,
	foundations of	theoretical	general	questions	competently,
	chemistry for	foundations of	theoretical basis	vaguely, but	orientated in
	knowledge, skills	chemistry on the	of chemistry on	competently,	the general
	and abilities in	topic, does not	the topic answers	orientated in the	theoretical
	their subsequent	answer the teacher's	the teacher's	general	basis of
	professional	questions	questions. He/she	theoretical basis	chemistry on
	activity.	Does not know how	gives a vague	of chemistry on	the topic
		to draw a conclusion	conclusion and	the topic. He/she	answers
		and cannot relate the	cannot relate the	gives a vague conclusion and is	additional
		topic to his/her future profession.	topic to his/her future profession.	able to relate the	questions of the teacher.
		ruture profession.	future profession.	topic to his/her	Gives a clear
				future profession.	independent
				ruture profession.	conclusion and
					is able to relate
					the topic to the
					future
					profession.
					future
					profession.
LO	Demonstrates	1) does not describe	1) describes	1) uses	1) can classify
7	knowledge of	morphological,	morphological,	knowledge of	microorganism
	classification and	physiological and	physiological and	morphological,	s according to
	biological properties of	antigenic properties	antigenic properties of	physiological and	their
	microorganisms	of microorganisms; 2) does not	microorganisms;	antigenic properties of	morphological, physiological
	(morphological,	understand the	2) understands the	microorganisms;	and antigenic
	physiological,	results of studies	results of research	2) explains the	properties;
	antigenic) and their	conducted to	conducted	results of studies	2) interprets
	ecology; methods	determine	to determine	conducted to	the results of
	of isolation of pure	morphological,	morphological,	determine	studies
	cultures and	physiological and	physiological and	morphological,	conducted to
	identification;	antigenic properties	antigenic	physiological and	determine
	principles of	of microorganisms;	properties of	antigenic	morphological,
	determining	3) does not know the	microorganisms;	properties of	physiological
	sensitivity/resistanc	methods of	3) possesses	microorganisms;	and antigenic
	e of	determining the	methods of	3) describes methods of	properties of
	microorganisms to antimicrobial	sensitivity of microorganisms to	determining the sensitivity of		microorganism
	antimiciobiai	microorganisms to	Schsilivity 01	determining the	s;

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		Cyllohya			1		
	T	Syllabus			-		
	agents;	antimicrobial agents.	microorganisms to antimicrobial agents.	sensitivity microorgar to antimicr agents	nisms obial	3) use quantitat and qualitate methods determine sensitivity microorgate s to antimicro agents	tive ative at to the the y of nism
LO 8	Demonstrates knowledge of/about the basics of genetics of microorganisms; essence of biotechnology; influence of environmental factors on microorganisms, purposes and methods of asepsis, antisepsis, sterilization, disinfection; chemotherapy and antibiotics; basics of epidemiology of infectious diseases, ways of infection, localization in the human body;	1) cannot tell about the methods of asepsis, antisepsis, sterilization and disinfection; 2) does not know about CTP and antibiotics used in the treatment of infectious diseases.	1) can talk about methods of asepsis, antisepsis, sterilization and disinfection; 2) knows about CTP and antibiotics used in the treatment of infectious diseases.	1) knows methods asepsis antiseps sterilization disinfecti 2) can tell a CTP an antibiotics u the treatme infection diseases	of s, is, n and on; about ad used in ent of us	1) show effective methods asepsis antiseps sterilizat and disinfective of CTP a antibiotiused in teatmen infection disease	vs ve s of s, iis, iion ion; s the ness and iics the t of us
LO 9	Possesses the skills of preparing a native smear, staining smears with simple and complex methods and interpreting the results of microscopy; culturing viruses; determining the sensitivity and/or resistance of microorganisms to	does not describe the technique of preparation of native preparations, staining with simple and complex staining methods, microscopy, and microbial culturing techniques.	1) describes the technique of preparation of native preparations, staining with simple and complex staining methods, microscopy, microbial culturing techniques.	1) knowled preparatio native preparatio staining v simple a complex stamethod microsco microbi culturin technique	on of ons, vith nd aining s, py, al	1) apply practice technique preparation native preparation staining value staining value staining method microscopic culturir	the e of on of e ons, with and ex g ls, opp, ial

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LO

12

-Ability to present

information

visually and

logically in the

Unable to visually

and logically present

information in the

form of a

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results results;

Able to present

information

clearly and

logically in the

processing the results;

Able to present

information in

a clear and

logical manner

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		Dynaous			
•	antimicrobial				techniques
	agents.				
LO	-Demonstrates	-does not	<ul> <li>demonstrates</li> </ul>	- demonstrates	-Demonstrates
10	knowledge of the	demonstrate	partial knowledge	knowledge of the	excellent
	subject matter and	knowledge of the	of the subject and	subject and tasks	knowledge of
	objectives of	subject matter and	tasks of anatomy,	of anatomy,	the subject and
	anatomy, histology	objectives of	histology and	histology and	tasks of
	and physiology,	anatomy, histology	physiology,	physiology, their	anatomy,
	their importance	and physiology;	makes gross	importance for	histology and
	for medicine;	-does not know the	errors;	medicine;	physiology,
	-knows the	structure and general	<ul> <li>does not fully</li> </ul>	-knows the	their
	structure and	regularities of	know the	structure and	importance for
	general regularities	functioning of cells,	structure and	general	medicine;
	of functioning of	tissues, regulation	general	regularities of	-excellent
	cells, tissues,	mechanisms	regularities of	functioning of	knowledge of
	regulation		functioning of	cells, tissues,	the structure
	mechanisms		cells, tissues,	mechanisms of	and general
	considered from		mechanisms of	regulation.	regularities of
	the perspective of		regulation, makes		functioning of
	general physiology		gross errors.		cells, tissues,
	and integrative				regulation
	human behavioral				mechanisms
	activity;				
LO	-distinguishes,	-does not	-partially	-distinguishes,	-perfectly
11	describes,	distinguish, describe,	describes,	describes,	distinguishes,
	compares features	compare features of	compares features	compares features	describes,
	of the structure of	the structure of	of the structure of	of the structure of	compares
	different cells,	different cells,	different cells,	different cells,	features of the
	tissues, organs of	tissues, organs of the	tissues, organs of	tissues, organs of	structure of
	the organism and	organism and does	the organism and	the organism and	different cells,
	explains their	not explain their	explains their	explains their	tissues, organs
	functions;	functions;	functions, makes	functions, makes	of the
	- possesses the	- does not know how	gross errors;	non-principled	organism and
	skills of conducting	to carry out	- partially	errors;	explains their
	laboratory studies	laboratory studies of	possesses the	- possesses the	functions;
	of cells and	cells and methods of	skills of	skills of	- has excellent
	methods of	processing the	laboratory	conducting	skills in
	processing the	results	research of cells;	laboratory studies	conducting
	results;			of cells and	laboratory
				methods of	studies of cells
				processing the	and methods of
				1 14 14	

Able to present

information in a

clear and logical

manner in the

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Syllabus

form of a	presentation.	form of a	form of a	Present
presentation.	- is unable to	presentation.	presentation.	information in
- compares	compare	-partially	- compares	the form of a
physiological	physiological	compares	physiological	presentation.
parameters	parameters	physiological	parameters	<ul> <li>perfectly</li> </ul>
(constants) of	(constants) of a	indicators	(constants) of a	Compares
healthy and sick	healthy and sick	(constants) of	healthy and sick	physiological
organisms;	organism;	healthy and sick	organism, making	indicators
- analyses the	-does not analyse the	organism, making	unprincipled	(constants) of a
information	information obtained	gross errors	errors;	healthy and
obtained in the	during experimental		- analyses	sick organism;
course of	observations, does		information	- freely
experimental	not determine its		obtained in the	analyses
observations,	significance for		course of	information
determines its	characterising the		experimental	obtained in the
analyses the	state of the		observations,	course of
information	organism.		determines its	experimental
obtained in the	analyses the		significance for	observations,
course of	information obtained		characterizing the	determines its
experimental	in the course of		state of the	significance
observations,	experimental		organism.	for
determines its	observations, does			characterising
significance for	not determine its			the state of the
characterising the	significance for			organism.
state of the	characterising the			
organism.	state of the			

#### 10.2 Criteria for assessing teaching methods and technology

organism.

Checklist for the practical session....

Control form	Evaluation	Evaluation criteria
Work in small	95-100% (4,0;	The student has completed all practical and
groups (practical	(A)	laboratory works and gives a complete answer to all
practical,		theoretical questions and test tasks. Actively
laboratory		participates, becomes an absolute leader in the
practical,		group, is able to conduct a dialogue between
laboratory		subgroups, uses self-assessment and self-
classes)		assessment.
	90-94% (3,67;	The student has completed all practical and
	A-)	laboratory works and gives a complete answer to all
		test questions. Actively participates, leads the
		subgroup, is able to dialogue between subgroups,
		uses self-assessment and self-assessment.
	80-89% (3,0; B;	The student knows the theoretical issues, timely
	3,33; B+)	submitted laboratory works and reports on them,
		and during the response in practical classes made
		unprincipled mistakes; positive assessment of tests.
		non-principled errors; positive assessment on tests.

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Syllabus	
	Actively participates in a subgroup, is able to conduct a dialogue between subgroups, uses self-assessment.
70-79% (2,33; C+; 2,67; B-)	The student knows the theoretical issues in time handed in laboratory works and reports on them, and during the answer at practical classes made fundamental errors; positive assessment on tests. Not very actively participates in a subgroup, is able to conduct a dialogue between subgroups, uses the self-assessment.
60-69% (1,67; C-; 2,0; C)	The student has some difficulties when answering in practical classes, made logical and stylistic errors when answering. Failed to complete laboratory work on time, handed in all reports on them; showed little activity in the class and needed the help of the teacher, partially completed the test tasks.
50-59% (1,0; D+)	The student has made gross errors when answering theoretical questions and does not understand the issues of the topic. Incompletely completed the laboratory work and reports on it, did not complete the test tasks. Did not show activity in the subgroup.
0-49% (0.24; F; 0.5; FX)	The learner has not prepared, does not know the topic and purpose of the class, as well as did not perform laboratory work, did not hand in reports and did not participate during the class, did not complete test tasks. Has not been active in the subgroup.

Control form	Evaluation	Evaluation criteria
Oral survey	Excellent Corresponds to grades: A (4,0; 95-100%); A- (3,67; 90-94%)	The learner answered all questions logically, clearly, competently, orientated in theories, concepts and directions on the topic. Also logically and competently answers to additional questions teacher.
	Good Corresponds to grades: B+ (3,33; 85-89%); B (3,0; 80-84%); B- (2,67; 75-79%) C+ (2,33; 70-74%)	The student made non-principled inaccuracies in his/her answers, which he/she corrects himself/herself. The learner answers additional questions of the teacher.  The student made non-principled inaccuracies in his/her answers, which he/she corrects. The learner answers the teacher's additional questions with non-principled mistakes.
	Satisfactory	The student made fundamental errors in his/her
	Corresponds to grades:	answers, which he/she corrects with the help of the

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	nistology»		] Hom p. 12	
	Syllabus			
	C (2,0; 65-69%); C- (1,67; 60-64%); D+ (1,33; 55-59%) D (1,0; 50-54%)	teacher. The student answ with fundamental errors. The student made fundamental answers, which he/she can help of the teacher. He/she additional questions.	nental errors in h	is/her
	Unsatisfactory Corresponds to grades: FX (25 - 49%) F (0-24)	The student made gross er which he/she cannot correct leading questions. The additional questions of the t	t, even with the tead learner cannot ar eacher.	cher's
Control form	Evaluation	Evaluation	criteria	
Solving problems	95-100% (4,0; A)	- the correct algoring problem is drawn up, there reasoning and in the characteristic solution, the correct and problem is solved in a ratio clear explanation of the solution ability to draw conclusion obtained data.	e are no errors in lo noice of formulae swer is obtained, nal way; gives a ful ution of the problem	and the ll and m, the
	90-94% (3,67; A-)	- the correct algoring problem has been drawn uperrors in logical reasoning formulas and solution, the obtained, the problem has lower, the ability to draw cobtained data.	p, there are gramm g and in the choice correct answer has been solved in a rate	atical ce of been tional
	80-89% (3,0; B; 3,33; B+)	- the correct algoring problem is drawn up, there in the logical reasoning and formulae for the solution explanation of the solution solved in an irrational was non-significant errors are answer is obtained.	are no significant of solution; the choice is correct; there on, but the problety or no more than made, and the co	errors ice of is an em is n two orrect
	70-79% (2,33; C+; 2,67; B-)	- the correct algoring problem is drawn up, there in the solution; the choice solution is correct; but the explanation of the solution solved in an irrational way significant errors are made obtained.	are no significant of ce of formulae fo ere is no full and on, or the proble or or more than two	errors r the clear em is non-
	60-69% (1,67; C-; 2,0; C)	- the problem is solved, be errors in the choice of form calculations, the problem is	nulas or in mathem not completely solv	atical ved
	50-59% (1,0; D+)	- the problem is solved	incorrectly, there	are

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		significant errors in logical reasoning and in the
		solution.
	0-49% (0.24; F; 0.5; FX)	- the task is not solved, no answer to the task.
Control form	Evaluation	Evaluation criteria
Tarkina	E	00.1000/
Testing	Excellent	90-100% correct answers
	Corresponds to grades:	
	A (4,0; 95-100%);	
	A- (3,67; 90-94%)	
	Good	70-89 % correct answers
	Corresponds to grades:	
	B+ (3,33; 85-89%);	
	B (3,0; 80-84%);	
	B- (2,67; 75-79%)	
	Satisfactory	50-69 % correct answers
	Corresponds to grades:	
	C+ (2,33; 70-74%);	
	C (2,0; 65-69%);	
	C- (1,67; 60-64%);	
	D+ (1,0; 50-54%)	
	Unsatisfactory	less 50% correct answers
	Corresponds to grades:	
	FX (25 - 49%)	
	F (0-24)	

		Presentation
Control form	Evaluation	Evaluation criteria
Topic	Excellent	The presentation is self-executed, on time, with at least 2
presentation	95-100 score 90-94 score	slides. At least 7 literature sources were used. The slide are informative and concise. At the defence the authordemonstrates deep knowledge of the topic. Does not mak mistakes when answering questions during the discussion
	<b>Good</b> 85-89 score 80-84 score 75-79 score 70-74 score	The presentation is self-executed, within the assigne deadline, with the volume of at least 17 slides. At least literature sources were used. The slides are informativ and concise. At the defence the author demonstrates goo knowledge of the topic. Makes non-principle mistakes in answering questions, which corrects himself.
	Satisfactory 65-69 score	The presentation is self-executed, on time, with at least 1 slides. At least 5 literature sources are used. The slides ar
	60-64 score	not informative. At the defence the author make
	50-54 score	fundamental errors in answering questions.
	Unsatisfactory	The presentation is not delivered on the due date, the
	0,5; 25-49 score	volume is less than 10 slides. Less than 5 literature
	0:0-24 score	sources are used. The slides are not informative. At the

#### OŃTÚSTIK QAZAQSTAN MEDISINA **АКАDEMIASY** «Оңтүстік Қазақстан медицина академиясы» АҚ

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		defence the author makes gross errors when answering
		questions. Does not orientate in his/her own material.
		lossary
Control form	Evaluation	Evaluation criteria
Preparing the	Excellent	- If the students have compiled a glossary on their own;
glossary	Corresponds to the	- The volume is at least 15 terms;
	<b>grades:</b> (4,0; 95-100%);	- The terms correspond to the defended topic;
	(3,67; 90-94%)	- The wording of the term is competent, corresponds to
		the biological meaning, complete;
		- The terms are arranged alphabetically, the etymology of
		the term is given of the term;
	Good	- If the students have compiled a glossary on their own;
	Corresponds to the	- The volume is at least 10-13 terms;
	<b>grades:</b> (3,33; 85-89%);	<ul><li>The terms correspond to the defended topic;</li><li>The wording of the term is competent, corresponds to</li></ul>
	(3,0; 80-84%);	the biological meaning, etymology is absent.
	(2,67; 75-79%);	- There is no alphabetical order;
	(2,33; 70-74%).	- There are some inaccuracies;
	Satisfactory	- If the trainees have compiled a glossary on their own;
	Corresponds to the	- The volume is at least 10 terms;
	<b>grades:</b> (2,0; 65-69%);	- The wording of the term corresponds to the biological
	(1,67; 60-64%);	meaning, but is not complete;
	(1,0; 50-54%)	- No alphabetical order;
		- No etymology;
	Unsatisfactory	- If the trainees have compiled a glossary on their own;
	Corresponds to the	- The volume is at least 10 terms;
	grades:	- The terms do not correspond to the topic;
	(0,5; 25-49%)	- There are serious biological errors. No alphabetical
	(0:0-24%)	order;
		- No etymology.
Control forms	Evaluation	Abstract Evaluation oritoria
Control form	Evaluation	Evaluation criteria
Preparation	Excellent	The abstract is neatly completed and submitted by the due
and defence	95-100 score	date, written independently on at least 15 pages of
of the abstract	90-94 score	typewritten text, using at least 7 literature sources.
		Schemes, tables and figures corresponding to the theme of
		the abstract are given. When defending the abstract, the
		text is not read, but narrated. Confidently and
	Cood	unmistakably answers all the questions asked.
	<b>Good</b> 85-89 score	The abstract is neatly completed and submitted by the due
	80-84 score	date, written independently on at least 13 pages of typewritten text, using at least 6 literature sources.
	75-79 score	Schemes, tables and figures corresponding to the topic of
	70-74 score	the abstract are given. the theme of the abstract. When
	70 71 50010	defending the abstract, the text is not read, but narrated.
		int according the test is not roud, but indirated.

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60-64 score

50-54 score

Unsatisfactory

24-49 score

0-24 score

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only to the educational literature specified by the teacher,

It is given in the case if the student during the answer

made fundamental errors, did not work through the basic literature on the topic of the class, can not use the

scientific terminology of the discipline, answers with gross stylistic and logical errors. gross stylistic and logical

had great difficulty in systematizing the material.

	histology»		110111 p. 42	
	Syllabus			
		When answering questions mistakes.	makes non-princi	pled
	Satisfactory 65-69 score 60-64 score 50-54 score	The abstract is neatly completed a date, written independently on typewritten text, using at least 5 defending the abstract, the te confidently answer questions, male	at least 10 pages literature sources. We ext is read. Does kes fundamental erro	s of When not ors.
	<b>Unsatisfactory</b> 0-49 score	The abstract is sloppy and not written independently on less than text, using less than 5 literary so the abstract, the text is read. When makes gross errors, is not orie material.	n 10 pages of typewr ources. When defenden answering quest	ding tions
Intermediate certi	fication			
miermediate certi				
Control form	Evaluation Evaluation	Evaluation cri	teria	
		The grade is given if the student mistakes or inaccuracies during the theories, concepts and direct under study and gives them a conscientific achievements of other descriptions.	lent has not made he answer. Orientate ctions of the discip critical assessment,	es in pline
Control form  Tests/ oral and written	Evaluation  Excellent 95-100 score	The grade is given if the student mistakes or inaccuracies during the theories, concepts and direct under study and gives them a concept to the study and gives the study and give	lent has not made he answer. Orientate ctions of the disciparitical assessment, isciplines. In during the answer answer, allowed tental errors correcte systematize the programment.	es in pline uses did non-ed by

Multi-point system of knowledge evaluation

Letter system	Numerical equivalent of	Percentage content	Evaluation in the
evaluation	scores		traditional system
A	4,0	95-100	Excellent
A -	3,67	90-94	
B +	3,33	85-89	Good
В	3,0	80-84	

errors.

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B -	2,67	75-79	
C +	2,33	70-74	
С	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	

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#### In Russian:

#### Basic:

- 1. Генетика. Учебник для ВУЗов/Под ред. Академика РАМН В.И. Иванова М.:: ИКЦ «Академкнига», 2006-638с.: ил.
- 2. Муминов Т. Основы молекулярной биологии:курс лекций.-Алматы: Эффект, 2007.

#### **Additional:**

- 1. Иванюшкин А.Я., Игнатьев В.Н., Коротких Р.В., СилуяноваИ.В.Изд-во Прогресс, М., 2008г.
- 2. У. Клаг, М. Каммингс. Основы генетики М.: Техносфера, 2009г.
- 3. Основы молекулярной биологии клетки. Учебник. Зтомах. Б.Альбертс и др., Изд-во OZON.RU, 2018г.

На английском языке:

#### Основная:

- 1. Jorde L. B., Carey J.C., Bamshad M. J. Medical Genetics, Elsevier, 2015
- 2. Cooper G. M., Hausman R. E. The Cell: a Molecular Approach. Sinauer Associates, 2015
- 3. Genetics [Текст] = Генетика : textbook / D. K. Aydarbaeva [and etc.]. Almaty : Association of hiighereducationalinstitutions of Kazakhstan, 2016. - 244 p
- 4. Alberts B. [et al.]. Molecular Biology of the CELL 3th ed., 2014
- 5. Batyrova, K. I. Introduction to biology [Текст] = Введениевбиологию: textbook / K. Aydarbaeva. Almaty: Association I.Batyrova, D. hiighereducationalinstitutions of Kazakhstan, 2016. - 316 p.

SKMA

SOUTH KAZAKHSTAN MEDICAL ACADEMY

«Оңтүстік Қазақстан медицина академиясы» АҚ АО «Южно-Казахстанская медицинская академия» Department of «Biology and Biochemistry», «Chemical disciplines», «Microbiology, virology and immunology», «Pathological anatomy and

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#### **Additional:**

1. Schumm, Dorothy E. Core Concepts in clinical Molecular biology [Текст] :монография / Dorothy E. Schumm. - First Edition. - New York : Lippincott - Raven Publichers Philadelphia, 1997. - 74 p.

#### Electronic textbooks

№	Name	Link
1	Electronic library	http://lib.ukma.kz
2	Republican interuniversity electronic library	http://rmebrk.kz/
3	Electronic library of the Medical University "Student Advisor"	http://www.studmedlib.ru
4	"Paragraph" information system "Medicine" section	https://online.zakon.kz/Medicine
5	Scientific electronic library	https://elibrary.ru/
6	Electronic library "BuxMed"	http://www.booksmed.com
7	«Web of science» (Thomson Reuters)	http://apps.webofknowledge.com
8	«Science Direct» (Elsevier)	https://www.sciencedirect.com
9	«Scopus» (Elsevier)	www.scopus.com
10	PubMed	https://www.ncbi.nlm.nih.gov/pubmed

#### **12.** Discipline policy

#### **Requirements for students:**

- 1. during the period of being on the territory of the department, fulfill the disciplinary requirements indicated at the entrance to the department;
- 2. compulsory attendance of lectures, practical and laboratory classes according to the schedule:
- 3. not be late for classes;
- 4. in the classroom to be in the special. clothes (robes, caps);
- 5. not to miss classes, in case of illness, provide a work sheet issued by the dean's office on the basis of a certificate of illness;
- 6. to work off missed classes according to the schedule of acceptance of workings by the teacher;
- 7. actively participate in the educational process;
- 8. comply with the internal regulations of the academy and ethics of conduct;
- 9. timely and accurately complete homework and IWT according to the IWT delivery schedule:
- 10. in case of non-fulfillment of tasks and missed lectures, the final grade is reduced;

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Department of «Biology and Biochemistry», «Chemical disciplines»,	46-
«Microbiology, virology and immunology», «Pathological anatomy and	p. 42
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- 11.be tolerant, open and friendly towards fellow students and teachers:
- 12. take good care of the property of the department;
- 13. in connection with the absence of lectures for no good reason, 1 point is deducted from the overall rating of the admission for each pass.
- 14. in connection with the absence of classes on the IWLT for an unjustified reason, for each absence, 2 points from the overall rating of admission.
- 15. upon receiving an unsatisfactory mark (0-49 points) at the midterm control, the student is not allowed to the final control.
- 16. If you receive unsatisfactory evaluation of the practical skills test, the student is not allowed to the final control.
- 17. In the conditions of distance learning: to familiarize in a timely manner with the tasks that are entered in the module "Assignment" AIS Platonus, to perform tasks in the lecture, practical training and SIW according to the schedule; to participate in the discussion of the main issues of the topic of classes, to perform individual or group tasks in the broadcasting platforms in the classes organized by the teacher (Zoom, WebExidr);
- 18. in case of absence of the student at lectures, practical classes, IWLT in the electronic logbook of AIS Platonicus, a note of absence ("a") is made.

#### 13. Academic policies based on the moral and ethical values of the academy

Realization of the principles and culture of academic honesty, which expresses the student's honesty in practical, laboratory work in the IWLT classes. As well as at examinations, expressing their position in their relations with teachers and administration.

The online proctoring system is used for distance learning of the discipline to verify the identity and confirm the results of online exams in compliance with academic integrity.

14. Approval and revision

date of approval by the Department of Biology and Biochemistry	Protocol №	Full name of Head department PhD in medicine., professor Esirkepov M.M.	Signature
date of approval by the Department of Chemical disciplines	Protocol №	Full name of Head department PhD in chemistry., acting associate professor Daurenbekov K.N.	Signature
date of approval by the Department of Microbiology, virology and immunology	Protocol №	Full name of Head department MD., professor Seithanova B.T.	Signature
date of approval by the Department of Pathological anatomy and histology	Protocol №	Full name of Head department acting associate professor Sadykova A.Sh.	Signature

# ONTÚSTIK QAZAQSTAN MEDISINA AKADEMIASY «Онтустік Қазақстан медицина академиясы» АҚ Department of «Biology and Biochemistry», «Chemical disciplines», «Microbiology, virology and immunology», «Pathological anatomy and P. 42

histology»

	Syllabus		
Date of approval by the	Protocol №	Chairperson of CEP Sadykova A.Sh.	Signature
СЕР		Sauykova A.Sii.	

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date of approval by the Department of Biology and Biochemistry	Protocol Na 17  26. 05. 23	Full name of Head department PhD in medicine., professor Esirkepov M.M.	Signature M.H.J
date of approval by the Department of Chemical disciplines	Protocol No 10	Full name of Head department PhD in chemistry., acting associate professor Daurenbekov K.N.	Signature-
date of approval by the Department of Microbiology, virology and immunology	Protocol No. 108	Full name of Head department MD., professor Scithanova B.T.	Signature
date of approval by the Department of Pathological anatomy and histology	Protocol № <u>11</u>	Full name of Head department acting associate professor Sadykova A.Sh.	Signature
Date of approval by the CEP	Protocol № 42 05:06:25	Chairperson of CEP Sadykova A.Sh.	Signature