


ОНТҮСТІК-ҚАЗАҚСТАН <b>MEDISINA</b> <b>AKADEMIASY</b> «Оңтүстік Қазақстан медицина академиясы» АҚ		 SOUTH KAZAKHSTAN <b>MEDICAL</b> <b>ACADEMY</b> АО «Южно-Казахстанская медицинская академия»
Department «Microbiology, Virology and Immunology»		50-11-
Working curriculum of the discipline «Microbiology and Immunology»		1p. out of 24


## Syllabus

### Department of «Microbiology, virology and immunology»

### Working curriculum of the discipline «Microbiology and Immunology»

### Educational program 6B10115 «Medicine»

1.	General information about the discipline		
1.1	Discipline code: MI 2219	1.6	Academic year: 2024-2025
1.2	Name of discipline: Microbiology and immunology	1.7	Course:2
1.3	Prerequisites: Molecular biology and medical genetics, chemistry, basic morphology and physiology	1.8	Semester: 4
1.4	Post-requests: Infectious diseases and infection control	1.9	Number of credits (ECTS): 5
1.5	Cycle: BD	1.10	Component: UC
2.	Description of the discipline (maximum 50 words)		
Morphophysiology and genetics of microorganisms, etiopathogenesis, immunity, laboratory diagnostics, prevention and etiotropic therapy of major bacterial, viral and fungal infections. General mechanisms of functioning of the immune system and modern immunological methods of diagnosis of infectious and non-communicable diseases.			
3.	Summative assessment form		
3.1	Testing ✓	3.5	coursework
3.2	Writing	3.6	Essay
3.3	Oral	3.7	Project
3.4	OSPE/OSKE or practical skills intake ✓	3.8	Other (specify)
4.	Aims of the discipline		
Private microbiology studies pathogenic microorganisms for humans: bacteria, viruses, fungi, protozoa, their morphology and physiology; the role of microorganisms in the etiology and pathogenesis of infectious diseases; the main clinical manifestations and the prevalence of the diseases caused; specific diagnosis, prevention and treatment of infectious diseases. The student, analyzing the results of diagnostic methods for antibiogram, argues his own recommendations for the use of antibiotics and immunobiological preparations.			
5.	Learning outcomes (RO disciplines)		
LO1.	Knows the factors and types of immunity, its significance for a person, the principles of immunoprophylaxis and immunotherapy of human diseases, the mechanisms of the formation of allergic reactions, the types of immunological reactions and their application in medical practice;		
LO2.	Knows taxonomy, morphological and biological properties of pathogens of infectious diseases, epidemiology, mechanisms and ways of transmission of pathogens, pathogenesis, main clinical manifestations of the disease, immunity, principles of laboratory diagnostics, specific treatment and prevention;		
LO3.	Interprets the results of bacteriological, virological and immunological research methods;		
LO4.	Analyzing the results of bacteriological, virological and immunological diagnostic methods and antibiogram, he argues his own recommendations on the use of antibiotics and immunobiological preparations;		
LO5.	Possesses the skills of taking biomaterial and sending the test material for microbiological research.		

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LO6.	Able to transfer own knowledge and skills in working with educational, reference, scientific information on microbiology and immunology;					
LO7.	Synthesizes and transforms the acquired knowledge for the purpose of further independent learning.					
5.1	LO disciplines	The learning outcomes of the EP with which the LO disciplines are associated				
	LO 1 LO 2	LO 1. Demonstrates and applies in practice fundamental knowledge in the field of biomedical, clinical, epidemiological and socio-behavioral sciences.				
	LO 3 LO 4	LO 2. Provides patient-centered care in the field of biomedical, clinical epidemiological and social behavioral sciences, aimed at the diagnosis, treatment and prevention of the most common diseases.				
	LO 6 LO 7	LO 7. Complies with the norms of public health protection, sanitary and hygienic regime and labor safety standards in healthcare organizations, epidemiological safety of the environment.				
	LO 5	LO 14. Conducts sanitary and educational activities to promote public health, preserve health and prevent diseases.				
6.	Detailed information about the discipline					
6.1	Venue (building, auditorium): South Kazakhstan Medical Academy, Department of Microbiology, Virology and Immunology. Al-Farabi-1 Square; building No. 2, I-floor, room No. 110, 112, 123a,b, 117, 119b, 511, 513, 514 Telephone. w\n 402					
6.2	Number of hours	Lectures	Practical lessons	Laboratory classes	ISWP	SIW
		10	40	-	15	85
7.	Information about teachers					
№	FULL NAME		Degrees and position		E-mail	
1.	Seytkhanova Bibigul Tolegenovna		Head of the department, doctor of medical sciences, professor		<a href="mailto:d.m.n._bibigul@mail.ru">d.m.n. bibigul@mail.ru</a>	
2.	Ratbek Saylaubekuly		Candidate of medical sciences		sailaubekuly_r@mail.ru	
3.	Serikpaeva Tamarakhan Tyulkubaevna		Senior Lecturer		tomarajan62@mail.ru	
4.	Nuralieva Gulmira Nurpapaevna		Senior Lecturer		nuralieva70@bk.ru	
5.	Abdramanova Aigerym Asylkhanovna		Senior teacher		<a href="mailto:aigera_0@mail.ru">aigera_0@mail.ru</a>	
6.	Polatbekova Shapagat Tolegenkyzy		Senior teacher		<a href="mailto:p.shapagat@mail.ru">p.shapagat@mail.ru</a>	
7.	Sadybek Uldana Abilkyzy		Senior teacher		<a href="mailto:sadybek.uldana@mail.ru">sadybek.uldana@mail.ru</a>	
8.	Zhakupova Zhanat Yerikovna		Senior teacher		zhanna.dzhakupova@inbox.ru	
8	Thematic plan					
A week	Topic title	Summary	RO module	Number of hours	Forms/ methods/ learning technologies	Forms/ assessment methods
1.	Lecture. The doctrine of immunity. Basic principles of organization and functioning of the immune system.	Types of immunity. Organs of the immune system. Immunocompetent cells and their main functions. Fundamentals of immunoprophylaxis. Vaccines and vaccine	LO1	1	Review	Feedback questions



		prevention of infectious diseases. Therapeutic and prophylactic sera and immunoglobulins. Principles for obtaining them.				
	<b>Practical lesson.</b> Immunity. Nonspecific resistance factors.	Humoral and cellular factors of nonspecific immunity. Natural resistance of the macroorganism. Methods for determining nonspecific protection factors and methods for assessing the immunological status of a microorganism. Phagocytosis.	LO1 LO2	3	Preparation and protection of a poster report, solution of situational tasks, fulfillment of tasks in the workbook.	Assessment by the checklist
	<b>LIWT/LIW.</b> The concept of intercellular cooperation in immunogenesis.	Immunocompetent cells of the human body. The concept of "immunity", the main functions of immunity. Types of immunity. The human immune system as a diffuse organ. Cells of the immune system.	LO6	1 (6)	Discussion of the presentation, preparation of situational tasks on the topic, writing an essay	Presentation, essay on the topic, preparation of situational tasks on the topic
2.	<b>Lecture.</b> Antigens. Antigen presenting cells. Antibodies. Cellular immune system.	General characteristics of antigens and antigen-presenting cells, their role in the induction and regulation of the immune response. Autoantigens. protective antigens. Basic functions of the T-system. Differentiation of T-lymphocytes. Dynamics of antibody formation. Primary and secondary immune response. Immunological memory and tolerance.	LO1	1	Visualization lecture	Feedback questions
	<b>Practical lesson.</b> Specific immune factors. Antigens and antibodies.	Methods for assessing the T and B-system of human immunity. Factors of immunity and assessment of the immunological status of the human body. Antigen-binding cells, their role in the induction and regulation of the immune response. Avidity.	LO1 LO2	3	Preparation and protection of a poster report, solution of situational tasks, fulfillment of tasks in the	Assessment by the checklist

					workbook.	
	<b>LIWT/LIW.</b> General characteristics of antigens. The role of immunoglobulin classes in immunity.	Antigens of bacteria and viruses, superantigens. Antigens of the human body. Interaction of antigens with immunocompetent cells of the body. Classes of immunoglobulins in the immunity of newborns in connection with their accumulation in the organisms of the mother and fetus. Antibodies. Chemical nature and structure of antibodies or immunoglobulins. Classes of immunoglobulins, their main characteristics, differences and features. Antiglobulin antibodies. Anti-idiotypic antibodies. The role of immunoglobulins in the immunity of newborns.	LO6	1 (6)	Discussion of the presentation, preparation of situational tasks on the topic, writing an essay	Presentation, essay on the topic, preparation of situational tasks on the topic
3.	<b>Lecture.</b> Serological reactions.	Reactions between antigens and antibodies in vitro or serological tests, widely used in microbiological and serological (immunological) laboratories for the diagnosis of infectious diseases.	LO1	1	Thematic	Feedback questions
	<b>Practical lesson.</b> Serological reactions.	General characteristics of serological reactions. Reaction mechanism, diagnostic value. Reactions proceeding with antigen enlargement (agglutination reaction, precipitation, immunodiffusion, immunoelectrophoresis, immunoblotting, Coombs reaction). Reactions occurring with the neutralization of the antigen (neutralization reaction, flocculation, hemagglutination inhibition reaction). Reactions involving complement (reaction of complement fixation, immune	LO1 LO2	4	Preparation and protection of a poster report, solution of situational tasks, fulfillment of tasks in the workbook.	Assessment by the checklist



		lysis, hemolysis, immobilization). Reactions involving labeled antigens and antibodies (immunofluorescence reaction, ELISA).				
	<b>LIWT/LIW.</b> Applied immunology. Molecular biological methods: NA hybridization, PCR, DNA sequencing	Nucleic acid hybridization method. Polymerase chain reaction. DNA sequencing method.	LO6	1 (6)	Discussion of the presentation, preparation of situational tasks on the topic, writing an essay	Presentation, essay on the topic, preparation of situational tasks on the topic
4.	<b>Lecture.</b> Causative agents of purulent-inflammatory and purulent-septic infections.	Biological properties of pathogens and microbiological methods for diagnosing staphylococcal, streptococcal, meningococcal, gonococcal infections, treatment and prevention.	LO2	1	Lecture - provocation (lecture with planned mistakes)	Feedback questions
	<b>Practical lesson.</b> Causative agents of purulent-inflammatory and purulent-septic infections.	Morphology, cultural properties, pathogenesis, microbiological diagnostics of staphylococci, pneumococci, streptococci. Principles of laboratory diagnostics. specific prophylaxis.	LO2 LO3 LO4 LO5	3	Preparation and protection of a poster report, performing laboratory work, fulfillment of tasks in the workbook.	Assessment by the checklist
	<b>LIWT/LIW.</b> Causative agents of sexually transmitted diseases.	Modern methods of diagnosis and treatment of sexually transmitted infections (syphilis, gonorrhea, urogenital chlamydia).	LO6 LO7	2 (6)	Discussion of the presentation, preparation of situational tasks on the topic, writing essays, analysis of scientific articles from scientific journals Scopus, Web of science (RBL), etc.	Presentation, essay on the topic, compilation of situational tasks on the topic, analysis of scientific articles.

5.	<b>Lecture.</b> Pathogenic clostridia. Causative agents of wound infections.	Pathogenic anaerobes. Biological properties of causative agents of tetanus, gas gangrene and botulism. Methods of microbiological diagnostics and prevention.	LO2	1	Review	Feedback questions
	<b>Practical lesson.</b> Causative agents of anaerobic infections.	Morphology, cultural properties, pathogenesis, microbiological diagnostics of clostridia (gas gangrene, tetanus, botulism). Specific prophylaxis. Sowing on Kitt-Taroczy medium.	LO2 LO3 LO4 LO5	3	Preparation and protection of a poster report, solution of situational tasks, fulfillment of tasks in the workbook.	Assessment by the checklist
	<b>LIWT/LIW.</b> Biological features of Pseudomonas aeruginosa and Haemophilus influenzae.	Microbiological diagnosis of diseases caused by Pseudomonas aeruginosa. Pathogenicity for humans and localization in the patient's body. The role of Pseudomonas aeruginosa in nosocomial infections. Antibiotic resistance. Haemophilus influenzae. Localization in the patient's body. Role in human pathology.	LO6 LO7	1 (6)	Discussion of the presentation, preparation of situational tasks on the topic, writing essays, analysis of scientific articles from scientific journals Scopus, Web of science (RBL), etc.	Presentation, essay on the topic, compilation of situational tasks on the topic, analysis of scientific articles.
6	<b>Lecture.</b> Causative agents of intestinal infections.	Escherichia coli. Morphology, cultural properties. Knowledge in human pathology. Salmonella is the causative agent of typhoid fever and paratyphoid fever. Morphology, cultural properties, pathogenesis, microbiological diagnostics. Causative agents of salmonellosis. Causative agents of dysentery. The main directions of bacteriological research in acute intestinal diseases.	LO2	1	Lecture - provocation (lecture with planned mistakes)	Feedback questions



	<b>Practical lesson.</b> Causative agents of intestinal infections. Pathogens of acute diarrheal infections. Cholera.	Morphology, cultural properties, pathogenesis, microbiological diagnosis of Escherichia, shigella, salmonella. Specific prevention and treatment. Clinical, epidemiological and pathogenetic features of cholera and other acute intestinal infections in the context of modern outbreak morbidity	LO2 LO3 LO4 LO5	3	Preparation and protection of a poster report, performing laboratory work, fulfillment of tasks in the workbook.	Assessment by the checklist
	<b>LIWT/LIW.</b>  Mid-term №1	Topics of lectures, practical exercises, self-study covered during the cycle	LO1-7	1 (6)	Assessment of midterm control (oral answer on ticket questions)	Oral response
7.	<b>Lecture.</b> Causative agents of especially dangerous infections.	Causative agents of cholera, plague, anthrax, CCHF. Morphology, cultural properties, pathogenesis, microbiological diagnostics of pathogens.	LO2	1	Consulting lecture	Feedback questions
	<b>Practical lesson.</b> Zoonotic pathogens.	Morphology, cultural properties, pathogenesis, microbiological diagnostics of plague, brucellosis, anthrax. Specific prophylaxis.	LO2 LO3 LO4 LO5	3	Preparation and protection of a poster report, solution of situational tasks, fulfillment of tasks in the workbook.	Assessment by the checklist
	<b>LIWT/LIW.</b> West Nile fever, Zoonotic cutaneous leishmaniasis.	Quarantine and zoonotic infections in Kazakhstan.	LO6 LO7	1 (6)	Discussion of the presentation, preparation of situational tasks on the topic, writing essays, analysis of scientific articles from scientific journals	Presentation, essay on the topic, compilation of situational tasks on the topic, analysis of scientific articles.


					Scopus, Web of science (RBL), etc.	
8.	<b>Lecture.</b> Mycoses and pathogenic protozoa.	Morphology, cultural properties, pathogenesis and classification of fungi and protozoa. Microbiological diagnostics. Pathogenicity factors. Sources of invasion, route of infection, life cycle of the parasite.	LO2	1	Review	Feedback questions
	<b>Practical lesson.</b> Causative agents of airborne infections.	Morphology, cultural properties, pathogenesis, microbiological diagnostics of causative agents of tuberculosis, meningococcal infection, diphtheria, whooping cough. Method of "cough plates". Allergic tests. specific prophylaxis.	LO2 LO3 LO4 LO5	3	Preparation and protection of a poster report, performing laboratory work, fulfillment of tasks in the workbook.	Assessment by the checklist
	<b>LIWT/LIW.</b> Mycoses and pathogenic protozoa.	Molds and their role in human pathology. Pathogenic protozoa. Role in human pathology. Microbiological diagnosis of mycoses and protozoal infections. Biological features and laboratory diagnostics of keratomycosis, trichomycosis, candidiasis, sporotrichosis, histoplasmosis.	LO6 LO7	2 (6)	Discussion of the presentation, preparation of situational tasks on the topic, writing essays, analysis of scientific articles from scientific journals. Scopus, Web of science (RBL), etc.	Presentation, essay on the topic, compilation of situational tasks on the topic, analysis of scientific articles.
9.	<b>Lecture.</b> Causative agents of respiratory viral infections.	Influenza virus. Parainfluenza viruses. Coronavirus infection. Morphology, cultural properties, pathogenesis and classification. Microbiological diagnostics.	LO2	1	Conference lecture	Feedback questions
	<b>Practical lesson.</b> Causative agents of transmissible	Biological features and laboratory diagnosis of relapsing fever, epidemic	LO2 LO3 LO4	4	Preparation and protection of	Assessment by the checklist



	infections.	typhus, Q fever, CCHF. Microbiological diagnosis of transmissible infections. Specific prevention and treatment.	LO5		a poster report, solution of situational tasks, fulfillment of tasks in the workbook.	
	<b>LIWT/LIW.</b> Herpesviruses (alpha, beta, gamma herpesviruses)	Human herpesvirus infections in the 21st century: principles of diagnosis and therapy.	LO6 LO7	1 (6)	Discussion of the presentation, preparation of situational tasks on the topic, writing essays, analysis of scientific articles from scientific journals Scopus, Web of science (RBL), etc.	Presentation, essay on the topic, compilation of situational tasks on the topic, analysis of scientific articles.
10.	<b>Lecture.</b> Human immunodeficiency virus and oncogenic viruses.	General characteristics and microbiological diagnosis of human immunodeficiency virus and oncogenic viruses.	LO2	1	Problematic	Feedback questions
	<b>Practical lesson.</b> Causative agents of acute respiratory viral infections.	Morphology, cultural properties, pathogenesis, microbiological diagnostics of influenza, parainfluenza, as well as adenovirus and coronavirus infections. Specific prophylaxis. Biomaterial sampling technique for the diagnosis of adenovirus and coronavirus infection.	LO2 LO3 LO4 LO5	3	Preparation and protection of a poster report, performing laboratory work, fulfillment of tasks in the workbook.	Assessment by the checklist
	<b>LIWT/LIW.</b> Causative agents of neuroviral infections.	Problems of rabies prevention. The current state of the problems of tick-borne encephalitis.	LO6 LO7	1 (6)	Discussion of the presentation, preparation of situational tasks on the topic, writing essays, analysis of	Presentation, essay on the topic, compilation of situational tasks on the topic, analysis of

					scientific articles from scientific journals Scopus, Web of science (RBL), etc.	scientific articles.
11.	<b>Practical lesson.</b> The causative agents of measles, rubella, chickenpox and mumps.	Morphology, cultural properties, pathogenesis, microbiological diagnostics of measles, rubella, chickenpox and mumps. Specific prophylaxis.	LO2 LO3 LO4 LO5	3	Preparation and protection of a poster report, solution of situational tasks, fulfillment of tasks in the workbook.	Assessment by the checklist
	<b>LIWT/LIW.</b> HIV (AIDS). Oncogenic viruses.	General characteristics of the human immunodeficiency virus and oncogenic viruses.	LO6 LO7	1 (5)	Discussion of the presentation, preparation of situational tasks on the topic, writing essays, analysis of scientific articles from scientific journals Scopus, Web of science (RBL), etc.	Presentation, essay on the topic, compilation of situational tasks on the topic, analysis of scientific articles.
12.	<b>Practical lesson.</b> Pathogens enterovirus and rotavirus infection, viral hepatitis.	General characteristics of enterovirus and rotavirus infection. Biological features and laboratory diagnosis of poliomyelitis. Enteroviral infections caused by COXSACKIE and ECHO viruses. Virological and serological diagnostic methods. Prevention.	LO2 LO3 LO4 LO5	4	Preparation and protection of a poster report, solution of situational tasks, fulfillment of tasks in the workbook.	Assessment by the checklist




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	<b>LIWT/LIW.</b> Mid-term №2	Topics of lectures, practical exercises, self-study covered during the cycle	LO 1-7	2 (5)	Assessment of midterm control (oral answer on ticket questions)	Oral response
<b>Preparation and conduct of intermediate certification</b>				15		
<b>9.</b>	<b>Teaching methods</b>					
9.1	Lectures	Review, visualization lecture, lecture - provocation (lecture with planned mistakes), thematic, conference lecture, consulting lecture, problematic.				
9.2	Practical lessons	Preparation and protection of a poster report, solution of situational tasks, performing laboratory work, fulfillment of tasks in the workbook.				
9.3	SIW/ISWP	Discussion of the presentation, preparation of situational tasks on the topic, writing essays, analysis of scientific articles from scientific journals Scopus, Web of science (RBL), etc.				
9.4	Mid-term	Assessment of midterm control (oral answer on ticket questions)				
<b>10.</b>	<b>Evaluation criteria</b>					
<b>10.1.</b>	<b>Criteria for evaluating the learning outcomes of a subject</b>					
	<b>Learning outcomes of the subject "Microbiology and Immunology"</b>	<b>Unsatisfactory</b>	<b>Satisfactory</b>	<b>Good</b>	<b>Excellent</b>	
	LO1 Knows the factors and types of immunity, its significance for humans, the principles of immunoprophylaxis and immunotherapy of human diseases, the mechanisms of the formation of allergic reactions, types of immunological reactions and their application in medical practice;	1) cannot describe immunotherapy and immunoprophylaxis;  2) does not know immunological reactions.	1) can describe immunotherapy and immunoprophylaxis;  2) knows immunological reactions.	1) uses knowledge about immunotherapy and immunoprophylaxis;  2) explains immunological reactions.	1) reveals the importance of immunotherapy and immunoprophylaxis;  2) uses immunological reactions in practice.	
	LO2 Knows the taxonomy, morphological and biological properties of pathogens of infectious diseases, epidemiology, mechanisms and ways of transmission of pathogens, pathogenesis, main clinical manifestations of the disease, immunity,	1) does not know the causative agents of infectious diseases; 2) does not understand the morphological and tinctorial properties of pathogens;	1) knows the causative agents of infectious diseases; 2) understands the morphological and tinctorial properties of pathogens; 3) mentions	1) describe the taxonomic categories of pathogens of infectious diseases; 2) knows how to conduct morphological research and describe the morphological	1) classifies pathogens of infectious diseases according to taxonomic categories; 2) independently conducts a morphological study and interprets the morphological and tinctorial	

principles of laboratory diagnostics, specific treatment and prevention;	3) does not mention cultural properties; 4) does not have information about the epidemiology, pathogenesis, clinical manifestations, immunity of infectious diseases; 5) does not describe methods of laboratory diagnostics; 6) does not know specific medical preparations; 7) does not understand the effectiveness of specific prophylaxis	cultural properties; 4) has information about the epidemiology, pathogenesis, clinical manifestations, immunity of infectious diseases; 5) describe methods of laboratory diagnostics; 6) knows specific medical preparations; 7) understands the effectiveness of specific prevention	and tinctorial properties of pathogens; 3) inoculates the studied material on nutrient media, has knowledge of cultural properties; 4) has knowledge in the field of epidemiology, pathogenesis, clinical manifestations, immunity of infectious diseases; 5) owns effective methods of laboratory diagnostics; 6) can separate specific therapeutic drugs depending on their sensitivity; 7) substantiate the effectiveness of specific prophylaxis.	properties of pathogens; 3) demonstrate the technique of inoculation of the test material on appropriate nutrient media and explain the cultural properties; 4) can substantiate the epidemiology, pathogenesis, clinical manifestations of infectious diseases, the mechanism of immunity; 5) can choose an effective method of laboratory diagnostics and implement it; 6) selects specific medicinal preparations taking into account sensitivity; 7) can explain the effectiveness of specific prophylaxis and recommend it.
LO3 Interprets the results of bacteriological, virological and immunological research methods;	1) does not understand the isolation of a pure culture of the pathogen by bacteriological examination; 2) does not describe the infection of the chick embryo by virological testing; 3) does not know about	1) understands the isolation of a pure culture of the pathogen by the method of bacteriological research; 2) describe the infection of the chick embryo by virological testing; 3) knows about enzyme	1) is able to isolate a pure culture of the pathogen by bacteriological examination; 2) can infect a chicken embryo by virological testing; 3) has knowledge of enzyme immunoassay, precipitation reactions.	1) isolates a pure culture of the pathogen by bacteriological research method and interprets the result; 2) can infect cell cultures, chicken embryos by virological examination and evaluate the result under a microscope;



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		enzyme immunoassay, precipitation reactions.	immunoassay, precipitation reactions.		3) can read the result of enzyme immunoassay, precipitation reaction.
	LO4 Analyzing the results of bacteriological, virological and immunological diagnostic methods and antibiogram, argues own recommendations on the use of antibiotics and immunobiological preparations;	1) does not know bacteriological, virological and immunological methods; 2) does not understand antibiotics and immunobiological preparations.	1) knows bacteriological, virological and immunological methods; 2) understands antibiotics and immunobiological preparations.	1) interprets the results of bacteriological, virological and immunological methods; 2) has knowledge of antibiotics and immunobiological preparations.	1) analyze the results of bacteriological, virological and immunological methods; 2) offers its own options for the use of antibiotics and immunobiological preparations..
	LO5 Possesses the skills of taking biomaterial and sending the test material for microbiological examination.	1) does not understand the studied material; 2) does not know laboratory research methods.	1) understands the studied material; 2) knows laboratory research methods.	1) has information about the research material required by the type of disease; 2) describes the methods of laboratory research.	1) can choose material for research depending on the type of disease; 2) most effectively directs the study of research material.
	LO6 Able to transfer own knowledge and skills in working with educational, reference, scientific information on microbiology and immunology;	1) does not know about the methods used in laboratory research of infectious diseases	1) knows about the methods used in laboratory research of infectious diseases	1) get acquainted with scientific papers on new methods used in laboratory research of infectious diseases	1) reads scientific papers and shares news about new methods used in laboratory research of infectious diseases
	LO7 Synthesizes and transforms the acquired knowledge for the purpose of further independent learning.	1) Has no desire for continuous self-education and development	1) Does not complete tasks	1) Completely completes tasks correctly	1) Demonstrates motivation for independent work, creative approach to completing tasks
<b>10.2 Assessment methods and criteria</b>					
<b>Checklist for practical training</b>					

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## Current control:

### EVALUATION CRITERIA FOR THE PRACTICAL LESSON CHECKLIST

№	Criteria for evaluation	Level			
		Excellent	Acceptable	Requires correction	Unacceptable
1	Preparation and protection of the poster report	17-20	15-17	10-15	0-10
2	Solving situational problems / Performing laboratory work	26-30	20-26	15-20	0-15
3	Completing assignments on the workbook	47-50	35-46	25-34	0-24
Final grade:		90-100	70-89	50-69	0-49

#### 1. Preparation and protection of the poster report

№	Criteria for evaluation	Points
1	The preparation of the poster and the compilation of the illustration correspond to the topic; the work contains complete, understandable information on the topic; visual aids (tables, diagrams, graphs, etc.) are used in the information; the speaker is fluent in the content, clearly and competently presents the material; the speaker freely and correctly answers questions and comments from the audience; the speaker fits exactly into the framework time limit (7 minutes)	17-20
2	The preparation of the poster and the compilation of the illustration correspond to the topic; the work contains complete, understandable information on the topic; visual aids (tables, diagrams, graphs, etc.) are not used in the information; the speaker is fluent in the content, but cannot clearly and competently present the material; the speaker allowed unprincipled inaccuracies when answering questions and comments from the audience, corrected by the student himself; the speaker tried to keep within the time limit (7 minutes)	15-17
3	The preparation of the poster and the compilation of the illustration correspond to the topic; the work contains complete, but not understandable information on the topic; visual aids (tables, diagrams, graphs, etc.) are not used in the information; the speaker is fluent in the content, but cannot clearly and competently present the material; the speaker, when answering questions and comments from the audience, made fundamental mistakes; the speaker did not meet the time limit (7 minutes)	10-15
4	The preparation of the poster and the compilation of the illustration does not correspond to the topic at all; the work lacks complete, understandable information on the topic; visual aids are not used in the information; the speaker does not know the content at all, cannot clearly and competently present the material; the speaker cannot answer questions and comments from the audience; the speaker generally does not fit into the framework of the regulations (7 minutes)	0-10



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## 2. a) Solution of situational problems

№	Criteria for evaluation	Points
1	The learner showed original thinking, showed a deep knowledge of the material, used the scientific achievements of other disciplines when answering. Used scientific terminology.	26-30
2	Actively participated in the work, showed knowledge of the material, made minor inaccuracies or fundamental errors corrected by the learner himself	20-26
3	When working in a group, he was passive, made inaccuracies and unprincipled mistakes, and experienced great difficulties in systematizing the material.	15-20
4	He did not take part in the work of the group, answering the questions of the teacher, made fundamental mistakes and inaccuracies, did not use scientific terminology when answering.	0-15

## b) Performing laboratory work


№	Criteria for evaluation	Points
1	Completed practical and laboratory work in a timely manner and without any errors and submitted reports on them, took an active part in the discussion of the results of the work, made reasonable conclusions, and showed original thinking	26-30
2	Timely completed practical and laboratory work and submitted reports on them without fundamental remarks, took an active part in the discussion of the results of the work	20-26
3	Timely completed practical and laboratory work and submitted reports on them. During work, he was not active, he needed the help of a teacher	15-20
4	Untimely, submitted reports on practical work, made fundamental mistakes in their implementation. Completed not all the practical work provided by the program. Did not participate in the discussion of the results of the work.	0-15

## 3. Completing assignments on the workbook

№	Criteria for evaluation	Points
1	The learner completed the work without mistakes or shortcomings. Allowed no more than one flaw	47-50
2	The learner completed the work in full, but made in it: no more than one serious mistake and one defect. Allowed no more than two shortcomings.	35-46
3	The learner correctly completed at least half of the work and made: no more than two gross mistakes or no more than one gross and one non-gross error and one defect. No more than two or three blunders, or one blunder and three shortcomings. In the absence of errors, but in the presence of four or five shortcomings.	25-34
4	The learner made the number of errors (shortcomings) exceeding the norm. Didn't start work. Correctly completed no more than 10% of all tasks	0-24

As a rule, several forms of knowledge control are used in the classroom.

The average score is given to the magazine.

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## Checklist for LIWT

### GRADING CRITERIA FOR LEARNERS' INDEPENDENT WORK UNDER THE GUIDANCE OF A TEACHER

#### Topic presentation

Form control	Grade	Criteria for evaluation
Topic presentation	<b>Excellent</b> A + (4,0; 95-100%) A- (3,76; 90-94%)	The presentation was made independently, at the appointed time, with a volume of at least 25 slides. At least 7 literary sources have been used. The slides are informative and concise. During the defense, the author demonstrates in-depth knowledge of the topic. Does not make mistakes when answering questions during the discussion.
	<b>Good</b> B+ (3,33; 85-89%) B- (2,67; 75-79%) C+ (2,33; 70-74%)	The presentation was made independently, at the appointed time, with a volume of at least 23 slides. At least 6 literary sources have been 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.
	<b>Satisfactorily</b> C (2,0; 65-69%) C- (1,67; 60-64%) D+ (1,33; 55-59%) D (1,0; 50-54%)	The presentation was made independently, at the appointed time, with a volume of at least 20 slides. At least 5 literary sources have been used. The slides are not meaningful. During the defense, the author makes fundamental mistakes when answering questions.
	<b>Unsatisfactory</b> FX (0,5; 25-49%) F (0; 0-24%)	The presentation was not delivered on time, the volume is less than 5-10 slides. Less than 5 literary sources have been used. The slides are not meaningful. During the defense, the author makes gross mistakes when answering questions. He does not know his own material.

#### Preparation of written creative work (essay)

Form control	Grade	Criteria for evaluation
Preparation of written creative work (essay)	<b>Excellent</b> A + (4,0; 95-100%) A- (3,76; 90-94%)	The content of the work fully corresponds to the topic; the topic is revealed in depth and reasoned. A coherent composition, logical and consistent presentation of thoughts. The problem of the essay is clearly formulated. There are no actual errors. The conclusion contains conclusions that logically follow from the content of the main part.



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	<b>Good</b> B+ (3,33;85-89%) B- (2,67; 75-79%) C+ (2,33;70-74%)	The theme is sufficiently fully and convincingly revealed with minor deviations from it. The thesis corresponding to the topic of the essay is clearly formulated. In the main part, it is logical, connected, but the thesis put forward is not fully proved, there are single factual inaccuracies.
	<b>Satisfactorily</b> C (2,0;65-69%) C- (1,67;60-64%) Д+ (1,33;55-59%) Д(1,0; 50-54%)	A correct, but one-sided or insufficiently complete answer to the topic is given. Deviations from it or individual errors in the presentation of the factual material were made. The material is presented quite logically, but there are some violations of the sequence of expression of thoughts. Conclusions do not fully correspond to the content of the main part
	<b>Unsatisfactory</b> FX (0,5; 25-49%) F (0; 0-24%)	the topic is completely unrevealed, which indicates superficial knowledge. It is characterized by a random arrangement of the material, the lack of communication between the parts. Differs in the presence of gross speech errors.

#### Preparation of situational tasks

Form control	Grade	Criteria for evaluation
Preparation of situational tasks	<b>Excellent</b> A + (4,0; 95-100%) A- (3,76; 90-94%)	The learner showed original thinking, showed a deep knowledge of the material, interdisciplinary connections were used in the preparation of the situational task. Used scientific terminology. Identified the main symptoms of the disease, microbiological laboratory data are correct.
	<b>Good</b> B+ (3,33;85-89%) B- (2,67; 75-79%) C+ (2,33;70-74%)	The learner, when compiling the task, made unprincipled inaccuracies, corrected by the student himself during the analysis of the task. Used scientific terminology. Identified the main symptoms of the disease, microbiological laboratory data are correct.
	<b>Satisfactorily</b> C (2,0;65-69%) C- (1,67;60-64%) Д+ (1,33;55-59%) Д(1,0; 50-54%)	The learner, when compiling a situational task, made inaccuracies and unprincipled mistakes, used scientific terminology. Experienced great difficulties in organizing the material. I was able to identify the main symptoms of the disease, microbiological laboratory data are indicated with slight inaccuracies.
	<b>Unsatisfactory</b> FX (0,5; 25-49%) F (0; 0-24%)	The learner made a situational task, made fundamental mistakes and inaccuracies. When compiling the task, he could not identify the main symptoms of the disease, and also indicated incorrect microbiological laboratory data.

### Analysis of scientific articles

Form control	Grade	Criteria for evaluation
Analysis of scientific articles	<b>Excellent</b> A + (4,0; 95-100%) A- (3,76; 90-94%)	The work was done carefully and delivered on time, written independently on at least 5 pages of printed text. Thoughts on the problem are presented in the form of brief theses, giving arguments. In the text of the work, references to the authors are indicated everywhere. When defending, the text does not read, but tells. Confidently and accurately answers all the questions asked. For work, I used articles no more than 5 years old and with a high Impact factor.
	<b>Good</b> B+ (3,33; 85-89%) B- (2,67; 75-79%) C+ (2,33; 70-74%)	The work was done carefully and delivered on time, written independently on at least 4 pages of printed text. Thoughts on the problem are presented in the form of brief theses, but without giving arguments. In the text of the work, references to the authors are indicated everywhere. When defending, the text does not read, but tells. When answering questions, he makes unprincipled mistakes. For work, I used articles no more than 5 years old and with a high Impact factor.
	<b>Satisfactorily</b> C (2,0; 65-69%) C- (1,67; 60-64%) D+ (1,33; 55-59%) D (1,0; 50-54%)	The work was done carefully and delivered on time, written independently on at least 3 pages of printed text. Thoughts on the problem are presented scattered, without giving arguments. References to the authors are not indicated everywhere in the text of the work. When protecting, the text reads. He answers questions uncertainly, makes fundamental mistakes. I used articles from more than 5 years ago and with an average Impact factor for my work.
	<b>Unsatisfactory</b> FX (0,5; 25-49%) F (0; 0-24%)	The work is written on less than 3 printed sheets. The thoughts are set out scattered. There are no references to the authors in the text of the work. There are no arguments. When protecting, the text reads. When answering questions, he makes gross mistakes, does not orient himself in the material. I used articles from more than 5 years ago and with a low Impact factor for my work.


### Checklist of intermediate certification



### MIDTERM CONTROL

Midterm is carried out in the form of an oral answer to the questions of the ticket. Each ticket consists of 3 theoretical questions. In total, 90-100 points are given as a maximum.

Form control	Grade	Criteria for evaluation
Assessment of boundary control (oral answer to ticket questions)	<b>Excellent</b> A + (4,0; 95-100%) A- (3,76; 90-94%)	1) the content of the ticket material is disclosed in full; 2) the material is presented correctly, in a certain logical sequence, terminology is accurately used; 3) the ability to illustrate theoretical positions with concrete examples, to apply them in a new situation is shown; 4) the answer is independent, without leading questions; 5) one or two inaccuracies were made when covering minor issues, which are corrected after comments or leading questions.
	<b>Good</b> B+ (3,33; 85-89%) B- (2,67; 75-79%) C+ (2,33; 70-74%)	The answer mostly satisfies the requirements for an “excellent” rating, but at the same time has one of the drawbacks: 1) there are small gaps in the presentation that do not distort the essence of the content of the answer; 2) one or two shortcomings were made when covering the main content of the answer, corrected after the examiner's remark; 3) an error was made or more than two shortcomings in the coverage of secondary issues, which are corrected after the examiner's remark.
	<b>Satisfactorily</b> C (2,0; 65-69%) C- (1,67; 60-64%) Д+ (1,33; 55-59%) Д (1,0; 50-54%)	1) the content of the material is incompletely or inconsistently disclosed, but a general understanding of the issue and skills sufficient for further assimilation of the material are demonstrated; 2) there were difficulties or mistakes were made in the definition of concepts, the use of terminology, corrected after several leading questions; 3) with incomplete knowledge of the theoretical material, insufficient formation of competencies, skills and abilities was revealed, the student cannot apply the theory in a new situation
	<b>Unsatisfactory</b> FX (0,5; 25-49%) F (0; 0-24%)	1) the main content of the educational material is not disclosed; 2) ignorance or misunderstanding of the most or most important part of the educational material is revealed; 3) errors were made in the definition of concepts, when using terminology, which were not corrected after several leading questions. 4) the answer to the question is completely absent. 5) refusal to answer.

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## CRITERIA FOR EVALUATING THE QUALITY OF THE TRAINEE'S ANSWER TO THE TICKET AT THE MIDTERM CONTROL

The ticket consists of 3 questions. Questions 1 and 2 have a maximum of 30 points, and Question 3 has a maximum of 40 points. The maximum total is 100 points.


Criteria for evaluating student responses	Number of points for each question		
	1 question	2 question	3 question
The learner did not answer the question	0	0	0
The learner did not show even a superficial knowledge of the essence of the question posed, giving an answer in relation to any term and general concept due to the examiner's leading question	7	7	10
The learner, answering the question of the ticket, is poorly oriented in the compulsory literature, makes gross mistakes in covering fundamental, key issues	15	15	20
When answering, the student needs additional questions, makes mistakes in the interpretation of individual, non-key points	20	20	25
The Learner competently answers the question within the framework of the mandatory literature, minor single inaccuracies are possible	25	25	30
The learner answers the question correctly, fully, uses additional literature	30	30	40
<b>TOTAL max for each question:</b>	<b>30</b>	<b>30</b>	<b>40</b>
<b>TOTAL max per ticket:</b>	<b>100</b>		

### Multi-point system of knowledge assessment


Score letter system	Digital equivalent of points	Percentage	Assessment according to the traditional system
A	4,0	95-100	<b>Excellent</b>
A -	3,67	90-94	
B +	3,33	85-89	<b>Good</b>
B	3,0	80-84	
B -	2,67	75-79	
C +	2,33	70-74	
C	2,0	65-69	<b>Satisfactorily</b>
C -	1,67	60-64	
D+	1,33	55-59	
D-	1,0	50-54	
FX	0,5	25-49	<b>Unsatisfactory</b>
F	0	0-24	

### 11. Learning Resources



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Electronic resources, including but not limited to: databases, simulation animations, professional blogs, websites, other electronic reference materials (e.g. video, audio, digests)	№	Name	Link
	1	Electronic library SKMA	<a href="http://lib.ukma.kz/repository">http://lib.ukma.kz/repository</a>
	2	Republican interuniversity electronic library	<a href="https://online.zakon.kz/Medicine">https://online.zakon.kz/Medicine</a>
	3	«Aknurpress» Digital library	<a href="https://www.aknurpress.kz/">https://www.aknurpress.kz/</a>
	4	«Epigraph» Electronic library	<a href="http://www.elib.kz/">http://www.elib.kz/</a>
	5	Epigraph - portal of multimedia textbooks	<a href="https://mbook.kz/ru/index/">https://mbook.kz/ru/index/</a>
	6	ABS IPR SMART	<a href="https://www.iprbookshop.ru/auth">https://www.iprbookshop.ru/auth</a>
	7	"Law" base of normative legal acts	<a href="https://zan.kz/ru">https://zan.kz/ru</a>
	8	Cochrane Library	<a href="https://www.cochranelibrary.com/">https://www.cochranelibrary.com/</a>
Electronic textbooks	<p>1. B. T. Seytkhanova, Sh. Zh. Kurmanbekova, Sh.T. Polatbekova, Sh.Zh. Gabdrakhmanova, A.N. Tolegen. CAUSATIVE AGENTS OF ACUTE RESPIRATORY VIRAL INFECTIOUS DISEASES (influenza virus, adenovirus, coronavirus) (I part) <a href="http://lib.ukma.kz/wp-content/uploads/2022/10/Illustrated-teach.-material-eng-2.pdf">http://lib.ukma.kz/wp-content/uploads/2022/10/Illustrated-teach.-material-eng-2.pdf</a></p> <p>2. B.T. Seytkhanova, Sh. Zh. Kurmanbekova, Sh.T. Polatbekova, Sh.Zh. Gabdrakhmanova, A.N. Tolegen. Pathogens of children's viral infections (measles, rubella, chickenpox and mumps virus) (Part II) <a href="http://lib.ukma.kz/wp-content/uploads/2022/10/illustrated-textbook.pdf">http://lib.ukma.kz/wp-content/uploads/2022/10/illustrated-textbook.pdf</a></p> <p>3. B.T. Seytkhanova, A.A. Abdramanova, A.N. Tolegen, P. Vinoth kumar Lecture complex on the subject "Microbiology and immunology " (General Microbiology) <a href="http://lib.ukma.kz/wp-content/uploads/2022/10/Lecture-complex-General-Microbiology-2022.pdf">http://lib.ukma.kz/wp-content/uploads/2022/10/Lecture-complex-General-Microbiology-2022.pdf</a></p> <p>4. B.T. Seytkhanova, A.A. Abdramanova, A.N. Tolegen, P. Vinoth kumar LECTURE COMPLEX ON THE SUBJECT "MICROBIOLOGY AND IMMUNOLOGY"(Private Microbiology) <a href="http://lib.ukma.kz/wp-content/uploads/2022/10/Lecture-complex-Private-Microbiology-2022.pdf">http://lib.ukma.kz/wp-content/uploads/2022/10/Lecture-complex-Private-Microbiology-2022.pdf</a></p>		
Literature	<p><b>Basic literature</b></p> <p>1. Murray P. R., Rosenthal K. S., Pfaller M. A. Medical Microbiology. - Mosby, 2015</p> <p>2. W. Levinson McGraw-Hill. Review of Medical Microbiology and Immunology, 2014</p> <p><b>Additional literature</b></p> <p>1. Saparbekova A.A. Microbiology and virology : educ. manual. - Second Edition. - Almaty : ЭСНП, 2023. - 188 с</p> <p>2. Gladwin Mark T. Clinical microbiology made ridiculously simple / Mark T. Gladwin, William Trattler, Scott C. Mahan . - 7th ed. - Miami : MedMaster, Ins, 2016. - 413 p.</p> <p>3. Usmle Step 1. Immunology and microbiology : Lecturer notes / Alley Tiffany L. [et. al.]. - New York, 2019. - 511 p. - (Kaplan Medical)</p>		

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## 12. Politics of discipline

- Mandatory attendance of lectures and practical classes according to the schedule;
- Do not be late for classes;
- Be in special clothes in the classroom (robe, caps);
- Do not miss classes, in case of a valid reason (illness, etc.) Provide a timely certificate, etc.;
- Work off missed classes in accordance with the established schedule, rules and requirements;
- Active participation in the educational process;
- Comply with intra-academic rules and ethics;
- Timely and correctly perform the assigned work and task, LIW;
- Failure to complete the task, the presence of missed lectures and laboratory classes leads to a decrease in the final grade;
- If one lecture session is missed without a valid reason, the penalty point is 2 points and is deducted from the midterm control.
- If the deadline is missed without a valid reason, 0 points are given.
- If the final rating is less than 30 points, the student is not allowed to take the exam;
- Observe subordination with teachers and fellow students;
- Take care of the department's property.
- Those who have taken part in olympiads and conferences and won prizes will be exempted from OSPE/OSKE.
- In order to motivate learners, with active participation in each practical and LIWGT classes; when completing the tasks of the LIWGT with the examination of articles in journals with the impact factor Scopus, Web of science, etc., students are awarded a diploma of the 1st degree and letters of thanks to their parents.
- In order to encourage students, if the total score in the subject is between 90% and 100%, they will be awarded a letter of appreciation at the end of each semester.

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

Academic policy. P. 4 Code of honor of students

Grading policy for the discipline: The final grade of the learner at the end of the course is made up of the sum of the admission rating (ARA) and the final control grade (OIC) and is set according to the point-rating letter system.  $IO = ORD + OIC$

The admission rating score (ORA) is equal to 60 points or 60% and includes: current control score (OTC) and midterm control score (ORC).

The assessment of current control (OTC) is the sum of the average grade for practical training + the average grade of SRO

The midterm control score (CQR) includes an average score of 2 colloquia.

The admission rating score (60 points) is calculated by the formula:  $ORC \text{ avg} \times 0.2 + OTK \text{ avg} \times 0.4$

The final control (IC) is carried out in the form of testing and the learner can get 40 points or 40% of the total mark.

During testing, the teacher is asked 50 questions.

The calculation of the final control is carried out as follows: if the learner answered correctly 45 questions out of 50, then this will be 90%.  $90 \times 0.4 = 36$  points.

The final mark is calculated if the student has positive marks both in the admission rating (RD) = 30 points or 30% or more, and in the final control (IC) = 20% or more.

Final grade (100 points) =  $ORC \text{ cf} \times 0.2 + OTC \text{ cf} \times 0.4 + IC \times 0.4$




Penalty points are subtracted from the average score of the current control.



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14. Approval, confirmation and revision			
Date of approval with the Library and information Center	Protocol №	Full name of the head of the LIC	Signature
14.06.2024	9	Derbishcheva R.I.	
Date of approval at the department	Protocol №	Full name of the head of the Department	Signature
5.06.2024	10a	Seitkhanova B.T.	
Date of approval for the AC/EP	Protocol №	Full name of the Chairman of the AC	Signature
14.06.2024	11	Kalmenov N.D.	
Date of revision at the department	Protocol №	Full name of the head of the Department	Signature
		Seitkhanova B.T.	
Date of revision on the AC/OP	Protocol №	Full name of the Chairman of the AC	Signature
		Kalmenov N.D.	

