Educational Institution "Royal Metropolitan University"
Department "Morphological and Fundamental disciplines"

on the discipline **"Microbiology. Virology. Immunology/"**
for students of specialty 560001 "General Medicine"

Form of study	full-time
Course	2
Semester	3/4
Zachet	3
Exam	4
Total credits according to the curriculum	8
Total hours according to the curriculum	240
Lectures	36
Practical classes	36
Independent work	48

Syllabus developer:
Peregudova O.V.

Reviewed and approved at a meeting of the department of "Morphological and Fundamental disciplines"
Protocol No. 1 from "9" September 2024.
Head of the department PhD Jalilova A.A.

(signature)

Bishkek 2024

1. General information

№		
1	**Teacher:**	**Peregudova Olga Viktorovna**
2	Phone number	+996555287052
3	E-mail	Olga.peregudova@icloud.com
4	Specialty	"General medicine" – Medical doctor
5	**Department**	Morphological and Fundamental Disciplines
6	**Academic year**	2024-2025
7	**Semester**	3rd and 4th
8	**Classroom**	406
9	**Discipline**	«Microbiology, Virology, Immunology»
10	**Credits**	8

2. The Description of Discipline

1.	**The description of discipline**	Microbiology is the science that studies the structure, functioning and ecology of microorganisms — tiny life forms of plant or animal origins are not visible to the naked eye. They are the ancestors of all living things and the support system for all other forms of life. Certain microbes pose a threat to human health and to the health of plants and animals. As the foundation of the biosphere and major determinants of human health, microbes claim a primary, fundamental role in life on earth. Hence, the study of microbes is pivotal to the study of all living things, and microbiology is essential and fundamental for the study and understanding action of pathogens on human body
2.	**The goal of discipline**	Formation of students' knowledge about the diversity of the microbial world, (a clear understanding of the structure and the functioning, regulation of microorganisms and viruses), their role in biological processes and in human pathology through the development of common cultural and professional competences aimed at ensuring sanitary and epidemiological welfare of the population, the preservation and improvement of health, the implementation of supervision in sphere of protection of consumer rights.
3	**Prerequisites**	Knowledge of Medical Biology, Biochemistry, Normal Physiology, Histology
4	**Postrequisites**	Pathological Physiology, Pathological Anatomy, Pharmacology, General Hygiene, Infectious diseases.
5	**Results disciplines' studying**	**Universal- general scientific competencies**: Ability and readiness to collect, process and explain, using modern information

technologies, the data necessary to form judgments on relevant social, scientific and ethical problems; Ability and readiness to work in a team, tolerantly perceive social, ethnic, confessional and cultural differences.

Instrumental competencies: Capability and readiness to work with computer equipment and software for system and application purposes for solving professional problems; Capability and readiness for written and oral communication in the state language and official languages, able to master one of the foreign languages to solve professional problems;

Social-personal and general cultural competencies: Ability and readiness to master the techniques of professional communication; build interpersonal relationships, work in a group, constructively resolve conflict situations, tolerate social, ethnic, confessional and cultural differences; Capability and readiness for continuous professional development, self-knowledge, self-development, self-actualization; manage time, plan and organize activities, build a strategy for personal and professional development and training;

General professional competencies: Ability and readiness to comply with the rules of medical ethics, laws and regulations on working with confidential information, maintain medical secrecy; Ability and readiness to analyze the results of their own activities to prevent medical errors, while being aware of disciplinary, administrative, civil, criminal liability; Ability and readiness to work with medical and technical equipment used in working with patients, apply the capabilities of modern information technologies to solve professional problems;

Diagnostic activity: Ability and readiness to make a diagnosis based on the results of biochemical and clinical studies, taking into account the course of pathology in organs, systems and the body as a whole; Ability and readiness to analyze the patterns of functioning of individual organs and systems, use knowledge of anatomical and physiological features, basic methods of clinical and laboratory examination and assessment of the functional state of the body of an adult and children, for the timely diagnosis of diseases and pathological processes;

Educational activities: Capability and readiness to train the population in basic hygiene measures and educational activities to form healthy lifestyle skills;

The student should know:

- Classification of microbes and viruses
- The morphology and structure of microbes and viruses.
- The influence of environmental factors on microbes and viruses.
- The physiology of bacteria. Viral replication. Genetics of microbes
- Antimicrobial drugs. Antibiotics
- Antigens. Lines of defense. Antimicrobial substances.
- Nonspecific components of immunity. First line of defense. Second line of defense. Phagocytosis. Inflammation. Complement system. Third line of defense.

		• Mechanisms of production of antibodies. • The main pathogenetic processes of hypersensitivity reactions. • Immunological tolerance and mechanisms of autoimmunity. Primary and secondary immunodeficiency

3. Name and volume of discipline

№	Name of discipline	Course	Semester	Duration in weeks	Number of credits	Time of academic hours		Time for Self studying work	Total time (hours)
						Lectures (hours)	Practice classes (hours)	SSW	
1	Microbiology. Virology. Immunology	3	3	18	4	36	36	48	120
2			4	18	4	36	36	48	120

4.Thematic plan of 3rd semester, modules, hours, weeks, dates

Plan of the discipline	Lecture/ practice classes	Topic	Date	Hours
Section 1 General Microbiology				
1 week	Lecture	Introduction to Microbiology, Virology, Immunology: definitions, objectives and history. Taxonomy and classification of microorganisms.	02.09.24 07.09.24	2
	Practice class	Microbiological laboratory. Laboratory equipment. Apparatus. Materials. Safety guidelines. Microbiological methods of research. Microscope. Types of microscope. Bright light microscope, dark field microscope. Luminescent microscope. Phase-contrast microscope. Electronic microscope.		2
2 week	Lecture	Morphology of microorganisms. Cell		2

		structure. Bacterial cell. Classification of bacteria.	09.09.24 – 14.09.24	
	Practice class	Morphology of bacteria. Classification of bacteria. Basic shape of bacteria. Bacterial Cell structure. Staining.		2
3 week	Lecture	Physiology of bacteria. Growth and multiplication. Metabolism. Tissue and cell culture.	16.09.24 – 21.09.24	2
	Practice class	Staining. Gram staining. Acid fast staining. Gimza staining. Capsule. India ink staining. Flagella staining. Motility test.		2
4 week	Lecture	Normal flora. Importance. (Advantages). Opportunistic pathogens. Hospital-acquired (Nosocomial) infections. Prevention and control of communicable diseases. Infection control.	23.09.24-28.09.24	2
	Practice class	Physiology of microorganisms. Essential and accessory nutrients. Growth factors. Metabolism. Enzymes. Fermentative activity. Classification of culture media		2
5 week	Lecture	Pathogenesis of bacterial infections. Infectious diseases. Classification. Prevention and control.	30.09.24-5.10.24	2
	Practice class	Growth factors. Metabolism. Enzymes. Fermentative activity. Classification of culture media	30.09.24-5.10.24	2
6 week	Lecture	Sterilization and disinfection, main principles of prophylaxis nosocomial infections	07.10.24 – 12.10.24	2
	Practice class	Pathogenesis of bacterial infections. Infectious diseases. Classification. Virulence factors. Pathogenicity. Toxins. Types of toxins.	07.10.24 – 12.10.24	2
7 week	Lecture	Antimicrobial therapy. General principles. Antibiotics. Mechanism of action.	14.10.24-19.10.24	2
	Practice class	Antimicrobial therapy. General principles. Antibiotics. Classification. Mechanism of action.	14.10.24-19.10.24	2
Module 1			14.10.24-19.10.24	2
Section 2 Private Bacteriology				
8 week	Lecture	Gram (+) coccus. Microbiological diagnostics of staphylococcal , streptococcal infections	21.10.24-26.10.24	2

	Practice class	Microbiological diagnostics of staphylococcal , streptococcal infections		2
9 week	Lecture	Gram (-) coccus. Microbiological diagnostics of meningococcal and gonococcal infection	28.10.24 – 02.11.24	2
	Practice class	Microbiological diagnostics of meningococcal and gonococcal infection		2
10 week	Lecture	Rod shaped bacteria. Microbiological diagnostics of Bordetella pertussis - whooping cough (Gram (-) rods), and diphtheria (Gram (+) rods)	04.11.24 – 09.11.24	2
	Practice class	Microbiological diagnostics of Bordetella pertussis and Corynebacterim diphtheria		2
11 week	Lecture	Microbiological diagnostics of tuberculosis, leprosy, actinomycosis	11.11.24 – 16.11.24	2
	Practice class	Microbiological diagnostics of tuberculosis, opportunistic infectious		2
12 week	Lecture	Microbiological diagnostics of esherichiosis, typhoid and paratyphoid. Microbiological diagnostics of dysentery and salmonellosis, cholera	18.11.24 – 23.11.24	2
	Practice class	Microbiological diagnostics of esherichiosis, typhoid and paratyphoid. Microbiological diagnostics of dysentery and salmonellosis, cholera		2
13 week	Lecture	Microbiological diagnosis of anaerobic infections: gas gangrene, tetanus, botulism	25.11.24 – 30.11.24	2
	Practice class	Microbiological diagnosis of anaerobic infections: gas gangrene, tetanus, botulism		2
14 week	Lecture	Microbiological diagnosis of anthrax, brucellosis	01.12.24 – 06.12.24	2
	Practice class	Zoonotic infections. Microbiological diagnosis of anthrax, brucellosis		2
15 week	Lecture	Microbiological diagnosis of plague, tularemia	08.12.24 – 13.12.24	2
	Practice class	Microbiological diagnosis of plague, tularemia		2
16 week	Lecture	Microbiological diagnosis of rickettsiosis disease, chlamydia	15.12.24 – 20.12.24	2
	Practice class	Microbiological diagnosis of rickettsiosis disease, chlamydia		2
17 week	Lecture	Microbiological diagnosis of syphilis, relapsing fever, leptospirosis	22.12.24 – 27.12.24	2
	Practice class	Spiral forms of bacteria Microbiological diagnosis of syphilis, relapsing fever, leptospirosis		2
18 week	Lecture	Microbiological diagnosis of Campyllobacter. Helicobacter pylori.	29.12.24 – 03.01.25	2
	Practice	Microbiological diagnosis of		2

	class	Campyllobacter. Helicobacter pylori.		
Module 2			29.12.24 – 03.01.25	72 h

Thematic plan of 4th semester, modules, hours, weeks, dates

Plan of the discipline	Lecture/ practice classe	Topic	Date	Hours
Section 1 VIROLOGY				
1 week	Lecture	Introduction on virology. Virological diagnostics of Coronaviruses. COVID-19.	27.01.24 – 01.02.25	2
	Practice class	Virological diagnostics of Coronaviruses. COVID-19		2
2 week	Lecture	Virological diagnostics of influenza, parainfluenza, measles, mumps, rubella	03.02.25 – 08.02.25	2
	Practice class	Virological diagnostics of influenza, parainfluenza, measles, mumps, rubella		2
3 week	Lecture	Parenteral infections. Virological diagnostics of HIV, hepatitis B, C, D.	10.02.25 – 15.02.25	2
	Practice class	Blood borne viral infections. Virological diagnostics of HIV, hepatitis B, C, D.		2
4 week	Lecture	Virological diagnostics of hepatitis A, E, Rotaviruses	17.02.25- 22.02.25	2
	Practice class	Virological diagnostics of hepatitis A, E, Rotaviruses		2
5 week	Lecture	Virological diagnostics of enteroviruses: polio, Coxsackie, ECHO	24.02.25 - 01.03.25	2
	Practice class	Virological diagnostics of enteroviruses: polio, Coxsackie, ECHO		2
6 week	Lecture	Virological diagnostics of rabies,viral encephalitis, hemorrhagic fevers	03.03.25 - 08.03.25	2
	Practice class	Virological diagnostics of rabies,viral encephalitis, hemorrhagic fevers		2
7 week	Lecture	Virological diagnostics of DNA viruses: Herpes virus, HPV, Poxvirus	10.03.25 – 15.03.25	2
	Practice class	Virological diagnostics of DNA viruses: Herpes virus, HPV, Poxvirus		2
Module 1			10.03.25 – 15.03.25	2
Section 2 Immunology				
8 week	Lecture	Introduction on Immunology. Definition of immunity. Types of immunity. Specific forms of the immune response. Innate immunity. Lines of defense. Antigens. Types of antigens. Human antigens. Blood groups antigens. HLA- system.	17.03.25 – 22.03.25	2

		Microbial antigens.		
	Practice class	Definition of immunity. Types of immunity. Specific forms of the immune response. Innate immunity. Lines of defense. Antigens. Types of antigens. Human antigens. Blood groups antigens. HLA- system. Microbial antigens.		2
9 week	Lecture	Innate immunity. Generative and peripheral organs of immune system. Immunopoetic lines. Development of blood cells. Leucocytes. Cells of immune system. Cell mediated immunity. Second line of defense. Phagocytosis. Disorders of phagocytosis. Complement system. Inflammation. Cytokines.	24.03.25 – 29.03.25	2
	Practice class	First and second lines of defense. Phagocytosis. Disorders of phagocytosis. Complement system. Inflammation. Cytokines.		2
10 week	Lecture	Third line of defense. Acquired immunity. MHC I and MHC II. Interaction of cells: T-c, B-c. APC. T-cell differentiation. Production of Antibodies. Antigen-antibody complex.	31.03.25 – 05.04.25	2
	Practice class	Third line of defense. Acquired immunity. MHC I and MHC II. Interaction of cells: T-c, B-c. APC. T-cell differentiation. Production of Antibodies. Antigen-antibody complex.		2
11 week	Lecture	Immune response. Forms of the immune response. Humoral immunity. Primary immune response. Secondary immune response. Immunoglobulins. Concepts of monoclonal antibodies.	07.04.25 – 12.04.25	2
	Practice class	Immune response. Forms of the immune response. Humoral immunity. Primary immune response. Secondary immune response. Immunoglobulins. Concepts of monoclonal antibodies.		2
12 week	Lecture	Applied immunology. Immunoprevention. Immunotherapy. Vaccines. Types of Vaccines Vaccinal prevention.	14.04.25-19.04.25	2
	Practice class	Applied immunology. Immunoprevention. Immunotherapy.		2

		Vaccines. Types of Vaccines. Vaccinal prevention.		
13 week	Lecture	Hypersensitivity Reactions. Allergens and their types. Definition and general characteristic of an allergy. Type I hypersensitivity. Relationship of an allergy, immunity and inflammation. Type II hypersensitivity. Type III hypersensitivity. Type IV Hypersensitivity. Mechanisms . Immunopathogenesis. Diseases.	21.04.25 - 26.04.25	2
	Practice class	Hypersensitivity Reactions. Allergens and their types. Definition and general characteristic of an allergy. Type I hypersensitivity. Relationship of an allergy, immunity and inflammation. Type II hypersensitivity. Type III hypersensitivity. Type IV Hypersensitivity. Mechanisms .Immunopathogenesis. Diseases.		2
14 week	Lecture	Autoimmune diseases. Auto or Self antigens. Auto antibody. Auto Immunity. Autoimmune diseases. Causes of Autoimmune Diseases. Classification. Pathogenesis of autoimmune diseases. Localized autoimmune diseases or Organ specific autoimmune diseases Systemic autoimmune diseases or Non-organ specific autoimmune diseases.	28.04.25 – 03.05.25	2
	Practice class	Autoimmune diseases. Auto or Self antigens. Auto antibody. Auto Immunity. Autoimmune diseases. Causes of Autoimmune Diseases. Classification. Pathogenesis of autoimmune diseases. Localized autoimmune diseases or Organ specific autoimmune diseases Systemic autoimmune diseases or Non-organ specific autoimmune diseases.		2
15 week	Lecture	Antiviral immunity. Cell mediated response. Resistance of viruses. Immunity to viruses. Protection against	05.05.25 – 10.05.25	2

		viruses. Interferons.		
	Practice class	Antiviral immunity. Cell mediated response. Resistance of viruses. Immunity to viruses. Protection against viruses. Interferons.		2
16 week	Lecture	Immunology of tumors. Transplant immunity. Forms of reactions of rejection. Immunological methods for effective transplantation.	12.05.25 – 17.05.25	2
	Practice class	Immunology of tumors. Transplant immunity. Forms of reactions of rejection. Immunological methods for effective transplantation.		2
17 week	Lecture	Immunodeficiency. Primary and secondary immunodeficiency. Classifications of immunodeficiency. Characteristics of the primary immunodeficiency and secondary immunodeficiency. AIDS. Molecular and Biologic Features of HIV. HIV Disease. Principles of Treatment and Prevention.	19.05.25 – 24.05.25	2
	Practice class	Immunodeficiency. Primary and secondary immunodeficiency. Classifications of immunodeficiency. Characteristics of the primary immunodeficiency and secondary immunodeficiency. AIDS. Molecular and Biologic Features of HIV. HIV Disease. Principles of Treatment and Prevention.		2
18 week	Lecture	Immunological methods of research.	26.05.25 – 31.05.25	2
	Practice class	Immunological methods of research.		2
Module 2 EXAM			June	72 h

Thematic plan of 4th semester (2024-2024), modules, hours, weeks, dates

Plan of the discipline	Lecture/ practice classe	Topic	Date	Hours
Section 1 Bacteriology/Virology				
1 week	Lecture	Microbiological diagnosis of anaerobic infections: gas gangrene, tetanus, botulism	02.09.24 – 07.09.24	2
	Practice			2

	class			
2 week	Lecture	Microbiological diagnostics of esherichiosis, typhoid and paratyphoid. Microbiological diagnostics of dysentery and salmonellosis, cholera	09.09.24 – 14.09.24	2
	Practice class	Microbiological diagnosis of anaerobic infections: gas gangrene, tetanus, botulism		2
3 week	Lecture	General properties of viruses Coronavirus. COVID -19	16.09.24 – 21.09.24	2
	Practice class	Microbiological diagnostics of esherichiosis, typhoid and paratyphoid. Microbiological diagnostics of dysentery and salmonellosis, cholera		2
4 week	Lecture	General properties of viruses. Coronavirus. COVID -19	23.09.24-28.09.24	2
	Practice class	General properties of viruses. Coronavirus. COVID -19.		2
5 week	Lecture	Respiratory viruses. Virological diagnostic of Influenza virus. Vaccination.	30.09.24 - 05.10.24	2
	Practice class	Specific and nonspecific treatment, specific and nonspecific prophylaxis. Vaccination, Flu vaccines.		2
6 week	Lecture	Important childhood viruses: Measles. Mumps. Rubella. Specific immunoprophylaxis. MMR vaccine, scheme, schedule of vaccination	07.10.24 - 12.10.24	2
	Practice class	Important childhood viruses: Measles. Mumps. Rubella. Specific immunoprophylaxis. MMR vaccine, scheme, schedule of vaccination		2
7 week	Lecture	Blood borne viral infections. Virological diagnostics of HIV, Hepatitis B, C, D.	14.10.24 – 19.10.24	2
	Practice class	Important childhood viruses: Measles. Mumps. Rubella. Specific immunoprophylaxis. MMR vaccine, scheme, schedule of vaccination		2
	Lecture	Virological diagnostics of Hepatitis A, E, Rotaviruses. Virological diagnostics of enteroviruses: poliovirus	21.10.24 – 26.10.24	2
Module 1	Practice class	Virological diagnostics of DNA viruses: Herpes virus, HPV, Poxvirus, Rabies virus. **Module 1**		
Section 2 Immunology				
8 week	Lecture	Introduction on Immunology. Definition of immunity. Types of immunity. Specific forms of the immune response. Innate immunity.	28.10.24 – 02.11.24	2

		Lines of defense. Antigens. Types of antigens. Human antigens. Blood groups antigens. HLA- system. Microbial antigens.		
	Practice class	Definition of immunity. Types of immunity. Specific forms of the immune response. Innate immunity. Lines of defense. Antigens. Types of antigens. Human antigens. Blood groups antigens. HLA- system. Microbial antigens.		2
9 week	Lecture	Innate immunity. Generative and peripheral organs of immune system. Immunopoetic lines. Development of blood cells. Leucocytes. Cells of immune system. Cell mediated immunity. Second line of defense. Phagocytosis. Disorders of phagocytosis. Complement system. Inflammation. Cytokines.	04.11.24 – 09.11.24	2
	Practice class	First and second lines of defense. Phagocytosis. Disorders of phagocytosis. Complement system. Inflammation. Cytokines.		2
10 week	Lecture	Third line of defense. Acquired immunity. MHC I and MHC II. Interaction of cells: T-c, B-c. APC. T-cell differentiation. Production of Antibodies. Antigen-antibody complex.	11.11.24 – 16.11.24	2
	Practice class	Third line of defense. Acquired immunity. MHC I and MHC II. Interaction of cells: T-c, B-c. APC. T-cell differentiation. Production of Antibodies. Antigen-antibody complex.		2
11 week	Lecture	Immune response. Forms of the immune response. Humoral immunity. Primary immune response. Secondary immune response. Immunoglobulins. Concepts of monoclonal antibodies.	18.11.24 – 23.11.24	2
	Practice class	Immune response. Forms of the immune response. Humoral immunity. Primary immune response. Secondary immune response. Immunoglobulins. Concepts of monoclonal antibodies.		2
12 week	Lecture	Applied immunology. Immunoprevention. Immunotherapy. Vaccines. Types of Vaccines Vaccinal	25.11.24-30.11.24	2

		prevention.		
	Practice class	Applied immunology. Immunoprevention. Immunotherapy. Vaccines. Types of Vaccines. Vaccinal prevention.		2
13 week	Lecture	Hypersensitivity Reactions. Allergens and their types. Definition and general characteristic of an allergy. Type I hypersensitivity. Relationship of an allergy, immunity and inflammation. Type II hypersensitivity. Type III hypersensitivity. Type IV Hypersensitivity. Mechanisms . Immunopathogenesis. Diseases.	02.12.24 - 07.12.24	2
	Practice class	Hypersensitivity Reactions. Allergens and their types. Definition and general characteristic of an allergy. Type I hypersensitivity. Relationship of an allergy, immunity and inflammation. Type II hypersensitivity. Type III hypersensitivity. Type IV Hypersensitivity. Mechanisms .Immunopathogenesis. Diseases.		2
14 week	Lecture	Autoimmune diseases. Auto or Self antigens. Auto antibody. Auto Immunity. Autoimmune diseases. Causes of Autoimmune Diseases. Classification. Pathogenesis of autoimmune diseases. Localized autoimmune diseases or Organ specific autoimmune diseases Systemic autoimmune diseases or Non-organ specific autoimmune diseases.	09.12.24 – 14.12.24	2
	Practice class	Autoimmune diseases. Auto or Self antigens. Auto antibody. Auto Immunity. Autoimmune diseases. Causes of Autoimmune Diseases. Classification. Pathogenesis of autoimmune diseases. Localized autoimmune diseases or Organ specific autoimmune diseases Systemic autoimmune diseases or Non-organ specific autoimmune diseases.		2

15 week	Lecture	Antiviral immunity. Cell mediated response. Resistance of viruses. Immunity to viruses. Protection against viruses. Interferons.	16.12.24 – 21.12.24	2
	Practice class	Antiviral immunity. Cell mediated response. Resistance of viruses. Immunity to viruses. Protection against viruses. Interferons.		2
16 week	Lecture	Immunology of tumors. Transplant immunity. Forms of reactions of rejection. Immunological methods for effective transplantation.	23.12.24 – 28.12.24	2
	Practice class	Immunology of tumors. Transplant immunity. Forms of reactions of rejection. Immunological methods for effective transplantation.		2
17 week	Lecture	Immunodeficiency. Primary and secondary immunodeficiency. Classifications of immunodeficiency. Characteristics of the primary immunodeficiency and secondary immunodeficiency. AIDS. Molecular and Biologic Features of HIV. HIV Disease. Principles of Treatment and Prevention.	30.12.24 – 04.01.25	2
	Practice class	Immunodeficiency. Primary and secondary immunodeficiency. Classifications of immunodeficiency. Characteristics of the primary immunodeficiency and secondary immunodeficiency. AIDS. Molecular and Biologic Features of HIV. HIV Disease. Principles of Treatment and Prevention.		2
18 week	Lecture	Immunological methods of research.	06.01.25 – 11.01.25	2
	Practice class	Immunological methods of research.		2
Module 2 EXAM			January	72 h

5. Schedule of consultation

Semester	Group	Day	Time	Classroom
3	GM-1-6	Thursday	10-00 -11-30	413
4	GM -1	Thursday	10-00 -11-30	413

6. Detention schedule

Semester	Group	Day	Time	Classroom
3	GM-1-6	Thursday	10-00 -11-30	413
4	GM -1	Thursday	10-00 -11-30	413

7. Literature

Literature

• Medical microbiology Jawetz, Melnick, Adelbergs, 2022.
• Medical microbiology Jawetz, Melnick, Adelbergs, 2019.
• Elseviers intergrated review Immunology and Microbiology,Houston, Texas 2022
• Medical Microbiology .Pozdeev O. K., Pokrovsky V. I., 2021
• Medical Microbiology, Virology and immunology under the editorship of Prof. Borisov L. B., M. 2021.
• Infectious diseases and epidemiology. Pokrovsky V. I., etc. M. 2021.
• Medical microbiology Jawetz, Melnick, Adelbergs, 2022.

A list of additional literature:

• Atlas of medical Microbiology, Virology and immunology A. A. Vorobyov, A. S. Bykov. Moscow, 2021.
• Microbiology for the Health Sciences . Gwendolyn R. W. Burton Paul Engelkirk. 15 -th edition. 2018
• Clinical microbiology made ridiculously simple. Mark Gladwin, M. D., Bill Tratler, M. D., 2022
• 2. Vorobjev A. A., Krivoshein Yu. s., Shirobokov V. P. Medical and health microbiology: a textbook for students of higher medical educational institution / A. A. Vorobyov, Yu. s. Krivoshein, V. P. Shirobokov – 2-e Izd., M.: Academy, 2021.
• 3. Emtsev V. T., Mishustin E. N. Microbiology: a textbook for vuzov -5-e Izd., Rev. and extra - M.: Drofa, 2019.
• 4.Medical Microbiology, Virology and immunology.Edited by Zvereva V. V., Boichenko M. N. The textbook in 2 volumes, Moscow: GEOTAR - Media, 2020.

Electronic source www.booksmed.com
www.mol-biol.ru
www.meduniver.com
www.medmaster.netbioterrorismdefense.html

8.Monitoring and evaluation of learning outcomes

Scoring Policy	Module 1	Module 2
Classroom work (activity in discussions, oral questioning)	40 points	40 points
Independent work	20 points	20 points
Report, etc.	40 points	40 points
Total per module:	100 points	100 points

Evaluation criteria:

Scales of correspondence between grades and scores for final exam	
Scores	**Valuation**
0- 59	**«unsatisfactory»**
60 – 74	**«satisfactory»**
75 – 89	**«good»**
90 – 100	**«excellent»**

9. Academic discipline policy (Student code ethics)**:**

- Mandatory class attendance.
- Activity on lessons, home task preparing
- Qualified SSW.
- Presence and availability on modules

Additional requirements:

а/ one lateness to the class or leaving it before the end is counted as one missed lesson, and must be reworked;

б/ unacceptable the use of cellphones during classes, late submissions od assignments, not to comply rules of conduct

Help: For consultation on SSW, for additional information on lectures and practice classes topics please, contact the teacher during hours allocated for reworks and consultation