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Federal State Budget Educational Institution
of Higher Education
Pacific State Medical University
of the Ministry of Health of the Russian Federation

APPROVED BY
First Vice-Rector
_____ / Trankovskaya L.V./
"9" июня 2025

DISCIPLINE WORK PROGRAM

Б1.О.13 Microbiology, virology

(name of discipline)

Specialty	**31.05.01 General Medicine for international students (in English)** (code, name)
Degree	Specialist's degree
Profile	02 "Healthcare" (in the field of providing primary health care to the population in medical organizations: polyclinics, outpatient clinics, inpatient/outpatient facilities of the municipal health care system)
Mode of study	Full-time
Period of mastering the BEP	**6 years** (nominal length of study)
Department	of Microbiology, Dermatovenereology and Cosmetology

Vladivostok, 2025

Program of the discipline **Б1.О.13 Microbiology, virology** is based on:
1) Federal State Educational Standard of Higher Education for the specialty approved by the Order No. 988 of Ministry of Science and Higher Education of the Russian Federation dated August 12, 2020.

2) Curriculum for the 31.05.01 General Medicine for international students (in English), profile 02 "Healthcare" (in the field of providing primary health care to the population in medical organizations: polyclinics, outpatient clinics, inpatient/outpatient facilities of the municipal health care system), approved by the Academic Council of FSBEI HE PSMU of the Ministry of Health of Russia, Report No. 8/24-25 dated March 31, 2025.

Work program for the discipline was developed by the writing team of the Department of Microbiology, Dermatovenereology and Cosmetology of the FSBEI HE PSMU of the Ministry of Health of Russia, under the guidance of the head of the department Doctor of Medical Sciences, Associate professor Zaitseva E.A.

Developed by:

Head of the Department	Doctor of Medical Sciences, Associate Professor	Zaitseva E.A.
(position held)	(academic degree, academic title)	(full name)
Assistant Professor of the Department	Ph.D. of Medical Sciences	Komenkova T.S.
(position held)	(academic degree, academic title)	(full name)
Assistant		Matosova E.V.
(position held)	(academic degree, academic title)	(full name)
Assistant		Dunaeva M.N.
(position held)	(academic degree, academic title)	(full name)

1. GENERAL PROVISIONS

1.1. Purpose and Objectives of Mastering Б1.О.13 Microbiology, virology

The purpose of mastering the discipline is acquiring knowledge of the theoretical foundations and patterns of interaction between micro- and macroorganisms; grasping the principles behind practical skills in microbiological research; mastering methods of microbiological, molecular biological, and immunological diagnostics; and the main areas of treatment and prevention of infectious and opportunistic human diseases.

Objectives of mastering the discipline:

1. Acquiring knowledge of the classification, morphology, and physiology of microorganisms, their biological and pathogenic properties, and their impact on public health; the development of symbiosis between the human body and microbes; the role of resident microbiota in the development of opportunistic diseases; and the role of the microbes in the etiology and pathogenesis of major human infectious diseases;
2. Acquiring knowledge of the genetic control of pathogenicity and antibiotic resistance in microorganisms, the mechanisms of resistance development, and methods for its determination;
3. Learning use of laboratory microbiological equipment; mastering methods of microbiological and immunological diagnostics of infectious and opportunistic diseases; studying an algorithm for identifying aerobic and anaerobic microorganisms and interpreting the results;
4. Learning to recognize the causes of imbalances in natural ecosystems. Mastering basic methods of sanitary and microbiological research regulating the levels and nature of microbial contamination; basic methods of sterilization and disinfection;
5. Performing independent activities aimed at developing the ability to compare facts, draw conclusions, and develop personal qualities, as well as developing a desire to utilize the achievements of modern science and the research of Russian scientists.

2. DISCIPLINE AS PART OF THE BASIC EDUCATIONAL PROGRAM

Discipline **Б1.О.13 Microbiology, virology** is included in the Mandatory part of the Unit 1 of the basic educational program for the specialty 31.05.01 General Medicine for international students (in English), profile 02 "Healthcare" (in the field of providing primary health care to the population in medical organizations: polyclinics, outpatient clinics, inpatient/outpatient facilities of the municipal health care system), and is part of the 3rd and 4th semesters' curriculum.

3. PLANNED LEARNING OUTCOMES OF THE DISCIPLINE

3.1. Mastering the discipline **Б1.О.13 Microbiology, virology** is aimed at the development of students' competencies. The discipline facilitates the development of students' competencies corresponding to the types of professional activity.

Name of competency category (group)	**Code and Name of competency of the graduate**	**Competency Indicators**
General Professional Competencies		
Etiology and pathogenesis	GPC-5. Is able to assess morphofunctional status, physiological states, and pathological processes in the human body when working to achieve objectives of professional activity	CI.GPC-5_1- assesses the morphofunctional state based on the acquired knowledge CI.GPC-5_2- distinguishes between pathological and physiological processes, identifies etiology of changes CI.GPC-5_3- provides diagnostic assessment of the identified changes

3.2. Types of professional activity corresponding to competencies developed over the course of mastering **Б1.О.13 Microbiology, virology**:

Types of professional activity objectives

1. *Medical*

Kinds of professional activity objectives

1. *Diagnostics*

3.3. Planned learning outcomes of mastering the discipline are represented by knowledge, skills, abilities and/or experience, characterize the stages of developing competencies and ensure achievement of the planned outcomes of mastering the basic educational program. Learning outcomes of a discipline are correlated with competency indicators.

4. SCOPE AND CONTENT OF THE DISCIPLINE

4.1. Scope of the Discipline and Types of Academic Work

Type of Academic Work		**Total Hours**	**Semesters**	
			3	**4**
			hours	**hours**
1		2	3	4
Classroom hours (total), including:		**132**	**68**	**64**
Lectures (L)		32	12	20
Practical classes (C)		100	56	44
Independent work of the student (IW), including:		**76**	**40**	**36**
Preparing for classes (CP)		60	34	26
Preparing for continuous assessment (CAP)		6	6	
Preparation for interim assessment (IAP)		10		10
Interim assessment		44		44
Type of interim assessment	pass/fail test (T)			
	exam (E)	E		E
TOTAL: TOTAL credit value	hrs.	**252**	**108**	**144**
	credits	**7**	**3**	**4**

4.2. Contents of the Discipline

4.2.1. Topics of Discipline Lectures and Academic Hours per Semester

No.	**Lecture Topic**	**Hours**
1	2	3
	Semester No. 3	
1.	The main historical stages of the development of microbiology and virology. Systematics and principles of classification of microorganisms. Morphology and structure of the main forms of microorganisms	2
2.	Physiology of microorganisms: nutrition, respiration, reproduction	2
3.	Morphostructural organization and physiology of viruses, features of their reproduction, cultivation methods. Bacteriophages	2
4.	Environmental microbiology. Normal human microbiota. Forms of relationships between microbes and other biological objects. Biofilms	2
5.	Antimicrobial chemotherapeutic agents. Classification. Interaction of antimicrobial chemotherapeutic agents with microorganisms. Mechanisms of bacterial resistance to antimicrobial agents	2
6.	Genetics: heredity and variability of microorganisms. Modern molecular genetic methods in the diagnosis of infectious diseases	2
Hours per semester total		**12**
	Semester No. 4	

1.	Infection and the infectious process. Pathogenicity factors and virulence of microorganisms	2
2.	Fundamentals of infectious immunology. Modern immunological methods in the diagnosis of infectious diseases	2
3.	Microbiology of intestinal infections	2
4.	Microbiology of bacterial zoonoses - brucellosis, anthrax, tularemia, plague	2
5.	Microbiology of pyogenic infections - aerobic (staphylococcosis, streptococcosis) and anaerobic (gas gangrene, tetanus)	2
6.	Microbiology of mycobacterioses - tuberculosis, leprosy. Non-tuberculous mycobacteria	2
7.	Medical mycology: superficial and deep mycoses	2
8.	Respiratory (pneumotropic) viral infections	2
9.	Neurotropic (rabies, encephalitis) and enterotropic (polio, rotavirus) viral infections	2
10.	Blood-borne viral infections (parenteral hepatitis). Hemorrhagic fevers, HIV infection	2
Hours per semester total		**20**

4.2.2. Topics of Discipline Practical Classes and Academic Hours per Semester

No.	Practical Class Topic	Hours
1	2	3
	Semester No. 3	
1	Organization and basic sanitary and anti-epidemic regulations of a microbiology laboratory. Bacterial morphology. Microscopic examination	4
2	Structure and tinctorial properties of bacteria. L-form bacteria. Morphology and structure of spirochetes, rickettsia, fungi, mycoplasmas, and chlamydia. Simple and complex staining methods. Functional methods for determining motility. Microscopic examination method - practical skills demonstration	4
3	Microbial physiology. Bacterial metabolism. Nutrition and its provision in laboratory conditions: nutrient media. Sterilization, disinfection, and quality control. Microbial physiology – respiration, growth, and reproduction	4
4	Cultivation of fungi, protozoa, rickettsia, and chlamydia. Cultural properties, microbiological research methods: isolation of pure cultures of aerobes and anaerobes, principles of microbial species identification. Non-culturable forms of bacteria	4
5	Viruses – morphology and physiology. Methods of virus cultivation and principles of their detection. Bacterial viruses – bacteriophages. Prions and prion proteins	4
6	Environmental microbiology. Forms of interaction between microorganisms. Biofilms and their formation mechanisms. Quorum sensing. Fundamentals of chemoprophylaxis and chemotherapy. Classification of antimicrobial agents, mechanism of action on bacterial cells. Mechanisms of resistance development. Determining the susceptibility of microbes to medications	4
7	Genetics and variability of microorganisms. Molecular genetic methods for studying microorganisms. Computer programs for assessing antibiotic resistance (AmRbook, etc.)	4
8	Infection and the infectious process. Pathogenicity and persistence of microorganisms. Sanitary microbiology of environmental objects. Healthcare-associated infections (ESKAPE pathogens)	4
9	Fundamentals of infectious immunology. Modern immunological methods in the diagnosis of infectious diseases	4
10	Microbiology of Escherichia coli, shigellosis, and salmonellosis (typhoid fever, paratyphoid fever). Microbiology of cholera and gallophilosis. Microbiology of foodborne toxic infections and intoxications. Principles of laboratory diagnostics	4

11	Microbiology of bacterial zoonoses – brucellosis, tularemia, anthrax, yersiniosis. Principles of laboratory diagnostics	4
12	Microbiology of staphylococcal and streptococcosis. Principles of laboratory diagnostics	4
13	Microbiology of wound (gas gangrene, tetanus) anaerobioses. Non-clostridial anaerobic infections. Principles of laboratory diagnostics	4
14	Microbiology of Neisseria infections (meningococci, gonococci). Microbiology of corynebacteriosis (diphtheria) and bordetellosis (pertussis, parapertussis). Haemophilus influenzae infection. Principles of laboratory diagnostics	4
Hours per semester total		**56**
	Semester No. 4	
1	Microbiology of mycobacterioses – tuberculosis, leprosy. Non-tuberculous mycobacteria. Modern diagnostic methods	4
2	Microbiology of legionellosis, mycoplasmosis. Chlamydia. Metods of laboratory diagnostics	4
3	Microbiology of spirochetosis. Microbiology of rickettsioses (epidemic, endemic). Methods of laboratory diagnostics	4
4	Medical mycology. Modern nomenclature and classification. Superficial and deep mycoses. Opportunistic mycoses. Mycotoxicoses. Modern antifungal agents and methods for determining susceptibility to antifungal agents. Principles of laboratory diagnostics	4
5	Microbiology of respiratory viral infections	4
6	Microbiology of neurotropic viral infections	4
7	Microbiology of viral hepatitis	4
8	Microbiology of hemorrhagic fevers	4
9	TORCH infections (toxoplasmosis, rubella, cytomegalovirus infection, herpes virus infections, etc.). Modern diagnostic methods	4
10	HIV infection. Modern diagnostic methods	4
11	Continuous assessment. Practical skills demonstration	4
Hours per semester total		**44**

4.2.3. Independent Work of the Student

No.	Name of the Discipline Section	Type of IW	Total Hours
1	3	4	5
	Semester No. 3		
1	General microbiology	Preparing for tests; Preparing slides presentations; Preparing for practical classes	26
2	Clinical microbiology	Preparing for tests; Preparing slides presentations; Preparing for practical classes; Working with mini-case studies	14
Hours per semester total			**40**
	Semester No. 4		
1	Clinical microbiology	Preparing for tests; Preparing slides presentations; Preparing for practical classes; Working with mini-case studies	36
Hours per semester total			**36**

5. REQUIREMENTS FOR IMPLEMENTATION OF DISCIPLINE

5.1. Discipline Requirements for Educational Materials and Provided Information

Essential reading

No.	Name/Title, Resource Type	Author(s)/Editor	Publisher Imprint, Web Address	Number of Copies (accesses) in the Library and Information Center
1	2	3	4	5
1	Medical Microbiology, Virology, Immunology : textbook. Vol. 1	ed. by V.V Zverev, M.N. Boichenko	M.: GEOTAR-Media, 2020. - 384 p. URL: http//www.studentlibrary.ru	Unlimited access
2	Medical Microbiology, Virology, Immunology : textbook : Vol. 2	ed. by V.V. Zverev, M.N. Boichenko	M.: GEOTAR-Media, 2020. - 392 p. URL: http//www.studentlibrary.ru	Unlimited access
3	Microbiology, virology, immunology : textbook	E.A. Mikhailova, L.M. Aznabayeva, I.E. Lyashenko [et al.]	M.: GEOTAR-Media, 2024. - 560 p. URL: http//www.studentlibrary.ru	Unlimited access

Online resources

1. Electronic library system "Student Consultant" http://studmedlib.ru/
2. Electronic library system "University Library Online"http://www.biblioclub.ru/
3. Electronic library system "Urait" https://urait.ru/
4. Electronic library system "BookUp" https://www.books-up.ru/
5. Resources owned by the Library and Information Center of FSBEI HE PSMU of the Ministry of Health of Russia https://tgmu.ru/university/bibliotechno-informacionnyj-centr/resursy-bic/sobstvennye/

Online resources and respective user guides are available on the Library and Information Center website Library and Information Center — PSMU (tgmu.ru)

5.2. Discipline Requirements for Facilities and Resources

Information on the facility and resource availability and requirements of the discipline is available on the Facility and resource availability and requirements. FSBEI HE PSMU of the Ministry of Health of Russia (tgmu.ru)" page of the official website of the university.

5.3. List of Information Technologies, Information and Reference Systems, Licensed and Free Software (Including Domestically-developed Software):

1. PolycomTelepresence M100 Desktop Conferencing Application (Videoconference system)
2. SunRav Software tTester
3. 7-PDF Split & Merge
4. ABBYYFineReader
5. Kaspersky Endpoint Security

6. INDIGO online testing system
7. Microsoft Windows 7
8. Microsoft Office Pro Plus 2013
9. 1C:University
10. GARANT system
11. MOODLE (Modular Object-Oriented Dynamic Learning Environment)

6. ASPECTS OF THE IMPLEMENTATION OF THE DISCIPLINE FOR STUDENTS WITH DISABILITIES AND SPECIAL NEEDS

6.1. Availability of Accessible Environment

For students with disabilities and special needs, if a written application is submitted, lectures and practical classes are carried out taking into account health limitations, individual capabilities and medical status (hereinafter referred to as individual characteristics) of the student. Compliance with the following general requirements is ensured: teaching aids for collective and individual use are provided, required technical assistance is provided by an assistant; buildings and premises where lectures and practical classes are taking place meet accessibility requirements, other arrangements lack of which makes it impossible or difficult to master the discipline are made.

6.2. Ensuring Compliance with General Requirements

When lectures and practical classes are carried out at the written application of the student, the following general requirements are met: lectures and practical classes for students with disabilities and special needs take place at the same location as for students who do not have disabilities, if this does not cause difficulties for students; an assistant (assistants), who provide(s) students with the necessary technical assistance taking into account individual characteristics of the student, is (are) provided; necessary teaching aids are provided, taking into account individual characteristics of the student.

6.3. Availability of the Internal Policies and Procedures of FSBEI HE PSMU of the Ministry of Health of Russia to Students with Disabilities in a Format Accessible to Them.

All internal policies and procedures of FSBEI HE PSMU of the Ministry of Health of Russia concerning the discipline are made available to students with disabilities in a format accessible to them.

6.4. Increase in the Time Limit of Interim Assessment for Students with Disabilities and Special Needs in Relation to the Established duration

Format of the interim assessment of academic performance within the scope of the discipline conducted for students with disabilities and special needs is selected taking into account individual characteristics of the students (orally, by writing on paper, by typing on a computer, as a test, etc.). The duration of the interim assessment in relation to the established duration is increased at the written application of the student with disabilities. Time limit for the student's preparation for the test is increased by at least 0.5 hours.

7. STAFFING REQUIREMENTS OF THE DISCIPLINE

Academic teaching personnel that ensure the implementation of the discipline education process meet the requirements of the Federal State Educational Standard of Higher Education for the 31.05.01 General Medicine for international students (in English) specialty; list of the aforementioned personnel is available on the website of the educational organization.



8. TUTORIAL WORK

Type of tutorial work	Forms and approaches to tutorial work	Assessment criteria
Assistance in personal growth	Overt Talks and problem-centric debates aimed at promotion of healthy lifestyle. Participation in interdepartmental conferences aimed at formation of healthy lifestyle and development of skills necessary to preserve and improve health.	Portfolio
	Covert – creating atmosphere and infrastructure. Developing a culture of healthy lifestyle, the ability to preserve and improve health. Creating atmosphere of kindness and respect with a high level of communication during implementation of the discipline.	
Civic position and values	Overt Conducting events that facilitate development of civil culture (roundtable discussions, discussions/debates, and talks). Short discussions on current significant events in case the latter occur.	Portfolio
	Covert Focusing on civic values-oriented position and legal awareness. Cultivating mindful social position during professional activity.	
Social values	Overt Highlighting aspects of organization of healthy lifestyle based on health-preserving technologies. Highlighting ecology-related questions, environmental issues as a factor affecting population health and select population risks.	Portfolio
	Covert Identification in social structure during period of education and in professional activity.	