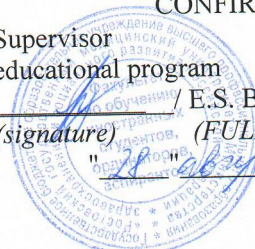


**FEDERAL STATE BUDGET EDUCATIONAL INSTITUTION
OF HIGHER EDUCATION
"ROSTOV STATE MEDICAL UNIVERSITY"
MINISTRY OF HEALTH OF THE RUSSIAN FEDERATION**

Faculty of Education of foreign students, residents and postgraduates

CONFIRM

Supervisor
educational program

 / E.S. Belousova /
(signature) (FULL NAME.)

" 28 августа 20 20

DISCIPLINE WORKING PROGRAM

MICROBIOLOGY AND VIROLOGY

Speciality 31.05.01 General medicine

Form of education full-time

**Rostov-on-Don
2020**

I. GOALS AND OBJECTIVES OF MASTERING THE DISCIPLINE

Goals mastering the academic discipline “microbiology, virology” consists of mastering knowledge about the patterns of interaction between micro- and macroorganisms, as well as the principles of microbiological, molecular biological and immunological diagnostic methods, the main directions of treatment and prevention of infectious and opportunistic diseases.

Tasks:

- students’ acquisition of knowledge about the structure and functioning of microbes as living systems, their role in ecology and interaction with the human body, including modern ideas about infectious antigens and the immune response to their appearance;
- training students in the most important methods of microbiological, molecular biological and immunological research, allowing them to interpret the results in order to correctly diagnose an infectious disease;
- training students in choosing optimal methods for taking material for microbiological examination in infectious diseases and drawing up an algorithm for differential diagnosis;
- training students in the most important methods of decontamination, including the basics of disinfection and sterilization techniques, to prevent the spread of infectious diseases and the occurrence of hospital-acquired infections;
- familiarization of students with the principles of organizing work in a microbiological laboratory, with occupational health and safety measures;
- developing students’ skills in working with scientific literature;
- formation of communication skills with patients, taking into account ethics and deontology, depending on the identified pathology;
- formation of students’ communication skills with the team;

II. REQUIREMENTS FOR THE RESULTS OF DISTRICT MASTERING

The process of studying the discipline is aimed at developing the following competence in accordance with the Federal State Educational Standard of Higher Education and the EP of Higher Education in this specialty:

general professional (GPC): GPC-9 (ability to assess morphofunctional, physiological states and pathological processes in the human body to solve professional problems).

III. THE PLACE OF DISCIPLINE IN THE STRUCTURE OF EP VO

2.1. The academic discipline “microbiology, virology” is basic.

2.2. The formation of the above competence is facilitated by the study of the following previous disciplines: biochemistry, histology, embryology, cytology, anatomy, normal physiology.

2.3. The discipline “microbiology, virology” creates the prerequisites for the formation of the specified competence in the disciplines: immunology, topographic anatomy and operative surgery, pharmacology, pathological anatomy, clinical pathological anatomy, pathological physiology, clinical pharmacology, fundamental medicine.

IV. CONTENT AND STRUCTURE OF DISCIPLINE

The complexity of the discipline in section 7, hour 252.

IV.1. Sections of the discipline studied in 3-4 semesters

Section no. A	Section name	Number of hours			SRS
		Total	Contact work		
			L	ET	

Semester 3					
1	General microbiology, morphology and ultrastructure of microorganisms	24	4	12	8
2	Physiology and ecology of microbes.	22	2	12	8
3	The doctrine of infection and anti-infective immunity. Immunological basis of diagnosis, treatment and prevention of infectious diseases	24	4	12	8
4	General virology. Genetics and microbial variability	21	6	9	6
	Interim certification form (test)	17	-	3	14
Total for the semester		108	16	48	44
Semester 4					
5	Privatemedical bacteriology.	78	12	36	thirty
6	Privatemedical virology.	thirty	4	12	14
Total for the semester		108	16	48	44
	Interim certification form (exam)	36			
<i>Total for the discipline:</i>		252	32	96	88

SRS –independent work of students

L– lectures

ETC- practical lessons

IV.2. Contact work

Lectures

No. section a	Lecture no.	Lecture topics	Number of hours
Semester 3			
1	1	Subject and tasks of medical microbiology. The place of medical microbiology in the system of medical sciences and its importance in the work of a doctor. Issues of development of world and domestic microbiology. Issues of medical ethics and deontology in medical microbiology.	2
1	2	Systems of microbes, morphology, anatomy bacteria. Mycoplasmas and L-forms, their medical significance.	2
2	3	Reproduction of bacteria. Questions of sanitary microbiology. Normal microbial biocenoses of the human body.	2
3	4	The doctrine of infection. Characteristics of the infectious process. Microbial factor in the infectious process. Pathogenicity and virulence of bacteria.	2

3	5	The doctrine of immunity. Forms of immunity. General characteristics of antigens. Nature, properties, functions. General characteristics of specific and nonspecific immunity factors.	2
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4	6	Introduction to the study of viruses. Structure, chemical composition of viruses and their interaction with the cell. Indication methods and virus identification.	2
4	7	Oncogenic viruses. Slow infections. Features antiviral immunity.	2
4	8	Bacterial viruses are bacteriophages. Genetics and variability microbes	2
Total for the semester hours			16
Semester 4			
5	10	Microbiological characteristics of meningococcal and gonococcal infections.	2
5	eleven	Pathogens of zoonotic infections: anthrax, plague, tularemia, brucellosis.	2
5	12	Gastrointestinal microbial pathology. Intestinal family bacteria. Escherichia coli. Escherichiosis. Intestinal dysbacteriosis.	2
5	13	Microbiology of diphtheria. Microbiology of tuberculosis and leprosy.	2
5	14	Anaerobic infection. General characteristics of pathogenic anaerobes. Pathogens of wound anaerobic infection: tetanus, botulism.	2
5	15	Pathogenic spirochetes. Treponematosi s, borreliosis, leptospirosis.	2
6	16	Viruses are causative agents of acute respiratory diseases.	2
6	17	Enteric viruses. Viral hepatitis.	2
Total by semester hours			16
<i>Total hours discipline:</i>			32

Seminars, practical work

No. chapter A	No. Seminar, ET C	Topics of seminars, practical work	Qty hours	Forms current control
Semester 3				
1	1	The structure of the bacteriological laboratory and the rules of work in it. Basic methods of microbiological diagnosis of infectious diseases. Morphology of bacteria, molds and yeast-like fungi.	3	testedYep, interview
1	2	Types of microscopy. Technique for preparing and staining a bacteriological preparation (smear). Simple and complex methods for staining preparations.	3	testedYep, interview
1	3	Structure of bacterial cells. Acid-fast bacteria. Ziehl-	3	testedYep, interview

		Neelsen staining. Sporulation in bacteria and its significance.		
1	4	Control class By section "General	3	solution

		microbiology, morphology and ultrastructuremicroorganisms"		situational problems, oral survey
2	5	Chemical composition of a bacterial cell. Nutrition and respiration of bacteria. Nutrient media.Bacteriological method research. Isolation of pure cultures of aerobes and anaerobes.	3	testedYes, interviewee tion
2	6	Growth and reproduction of bacteria. Isolation of a pure culture of aerobes. The influence of physical and chemical factors on microorganisms. Methodssterilization. Disinfection. Asepsis. Antiseptic.	3	testedYes, interview
2	7	Ecology of microbes (microecology).Distribution of microbes in the environment. Microbiota of the human body.	3	testedYes, interviewee tion
2	8	Test lesson on the section "Physiology and ecology of microorganisms".	3	solving situational problems, oral survey
3	9	Infection. Mechanisms of specific andnonspecific anti-infectiveresistance. Pathogenicity, enzymespathogenicity and exotoxins of microorganisms. Methods for their determination.	3	testedYes, interview
3	10	Antigens. Antibodies. Immunodiagnosticreactions.	3	testedYes, interviewee tion
3	eleven	Immunodiagnostic reactions (continued). The body's immune system and its functions.Specific immunoprophylaxis And immunotherapy.	3	testedYes, interviewee tion
3	12	Test lesson on the section "Teaching about infection. Immunological bases of diagnosis, prevention and treatment of infectious diseases."	3	solving situational problems, oral survey
4	13	General characteristics of viruses, cultivation methods. Methods for diagnosing viral infections. Virological diagnostic method. Features of antiviral immunity.	3	testedYes, interviewee tion
4	14	Bacteriophages. Genetics and variability of microbes. Antibiotics.	3	testedYes, interviewee tion
4	15	Test lesson by section "Generalvirology. Genetics and	3	situational solution

		variability of microbes".		s tasks,
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				oral survey
1-4	16	Final lesson for semester 3	3	interviewee tion
Total for the semester hours			48	
Semester 4				
5	17	Microbiological diagnosis of staphylo-, strepto-, and pneumococcal infections. Pathogens and microbiological diagnosis of sepsis.	3	testedYep, interviewee tion
5	18	Microbiological diagnosis of meningo- and gonococcal infections. Anaerobic cocci, Haemophilus influenzae, Bordetella, Pseudomonas aeruginosa wand.	3	testedYep, interviewee tion
5	19	Pathogens of zoonotic infections: brucellosis, plague, tularemia, Siberian ulcers Microbiological diagnostics zoonoticinfections.	3	testedYep, interviewee tion
5	20	Test lesson on material 17, 18, 19 practical lessons of the section "Private medical bacteriology".	3	solving situational problems, oral survey
5	21	General characteristics of enterobacteria. Diagnosis of escherichiosis, klebsiellosis. Intestinal eu- and dysbiosis.	3	testedYep, interviewee tion
5	22	Microbiological diagnosis of typhoid fever, hospital-acquired salmonellosis, dysentery, campylobacteriosis and helicobacteriosis.	3	testedYep, interviewee tion
5	23	Microbiological diagnosis of cholera, pseudotuberculosis, intestinal yersiniosis, microbial food poisoning.	3	testedYep, interviewee tion
5	24	Test lesson on material 21, 22, 23 of practical classes in the section "Private Medical Bacteriology".	3	solving situational problems, oral survey
5	25	Microbiological diagnostics diphtheria, tuberculosis, leprosy.	3	testedYep, interviewee tion
5	26	Microbiological diagnostics diseases, caused by pathogenic anaerobes.	3	testedYep, interviewee tion

5	27	Microbiological diagnosis of spirochetal	3	tested
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		infections, mycoses, rickettsioses, chlamydia, mycoplasmosis.		Yep, interviewee tion
5	28	Test lesson on material 25 26, 27 practical lessons of the section "Private medical bacteriology".	3	solving situational problems, oral survey
6	29	Diagnosis of ARVI, their role in pathology. Microbiological diagnosis of influenza, adenoviral infection, measles, epidemic mumps, rubella.	3	tested Yep, interviewee tion
6	thirty	Microbiological diagnosis of polio, diseases caused by Coxsackie and ECHO viruses. Microbiological diagnostics of rota-, noro- and astrovirus infection and viral hepatitis.	3	tested Yep, interviewee tion
6	31	Diagnosis of herpetic HIV infections, rabies. Diagnosis of tick-borne encephalitis, hemorrhagic fevers, papillomavirus infections	3	survey
6	32	Test lesson on the section "Private medical virology". Testing on topics of practical classes No. 17-31.	3	testing, solving situational problems, oral survey
Total by semester hours			48	
<i>Total hours discipline:</i>			96	

IV.3. Independent work of students

Section number	Type of student's independent work	Number of hours	Form current control
Semester 3			
1	Preparation To classes And current control	8	testing, solving situational problems, oral questioning
2	Preparation To classes And current control	8	testing, solving situational problems, oral questioning
3	Preparation To classes And current control	8	testing, solving situational problems, oral questioning

4	Preparatio ncontrol	To classes	An d	current	6	testing, solving situational problems, oral questioning
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1-4	Preparation for testing	to the final	14	testing, solving situational problems, oral survey
Total hours per semester			44	
Semester 4				
5	Preparation	current activities	thirty	testing, solution situational tasks, oral questioning
	Tocontrol			
6	Preparation	current activities	14	testing, solving situational problems, oral survey
	Tocontrol			
Total hours per semester			44	
<i>Total for the discipline:</i>			88	

V. ASSESSMENT FUND FOR CURRENT CONTROL AND INTERMEDIATE CERTIFICATION

The fund of assessment tools for determining the level of development of competencies as a result of mastering the discipline is an appendix to the work program.

VI. EDUCATIONAL AND METHODOLOGICAL SUPPORT OF DISCIPLINE

6.1. Main literature.

1. Borisov L.B. Medical microbiology, virology, immunology / L.B. Borisov. - 5th ed., rev. - M.: MIA, 2016. – 792 p.
2. Zverev V.V. Medical microbiology, virology and immunology: textbook / V.V. Zverev, A.S. Bykov. – M.: MIA, 2016. – 816 p.

6.2. Additional literature.

1. Microbiology, virology: a guide to practical exercises: textbook. manual for university students / ed. V.V. Zvereva, M.N. Boychenko. – M.: GEOTAR-Media, 2015. – 359 p.
2. Vaccines and vaccination: national leadership: brief edition / ed. V.V. Zvereva, R.M. Khaitova. – M.: GEOTAR-Media, 2014. – 640 p.
3. Kovalchuk L.V. Clinical immunology and allergology with the basics of general immunology: textbook [rec. State Educational Institution of Higher Professional Education “Moscow. honey. Academy named after THEM. Sechenov”]: for university students / L.V. Kovalchuk, L.V. Gankovskaya, R.Ya. Meshkova. – M.: GEOTAR-Media, 2014. – 639 p.
4. HIV infection and AIDS: national leadership / ed. V.V. Pokrovsky; Association of Medical Societies for Quality. – M.: GEOTAR-Media, 2013. – 606 p.

6.3. Internet resources.

No. p/p	ELECTRONIC EDUCATIONAL RESOURCES	Access to the resource
1.	Electronic library RostSMU. – URL: http://109.195.230.156:9080/opac/	Unlimited access
2.	Student Advisor: EBS. – Moscow: LLC “IPUZ”. - URL: http://www.studmedlib.ru	Unlimited access
3.	Doctor's consultant. Electronic medical library: EBS. – Moscow: LLC GC “GEOTAR”. - URL: http://www.rosmedlib.ru	Unlimited access

4.	UpToDate: DB / Wolters Kluwer Health. – URL: www.uptodate.com	Access is not limited
5.	Consultant Plus: reference legal system. - URL: http://www.consultant.ru	Access from computers university
6.	Scientific electronic library eLIBRARY. - URL: http://elibrary.ru	Open access
7.	National Electronic Library. - URL: http://neb.rf/	Access from computers libraries
8.	Scopus/ Elsevier Inc., Reed Elsevier. – Philadelphia: Elsevier BV, PA. – URL: http://www.scopus.com/ (National project)	Access is not limited
9.	Web of Science/ Clarivate Analytics. – URL: http://apps.webofknowledge.com (National project)	Access is not limited
10.	ScienceDirect. Freedom Collection [journals] / Elsevier. – URL: www.sciencedirect.com by IP addresses of RostSMU. (National project)	Access is not limited
elev en.	Springer Nature database. – URL: http://link.springer.com/ via IP RostSMU addresses. (National project)	Access is not limited
12.	Wiley Online Library /John Wiley & Sons. – URL: http://onlinelibrary.wiley.com by IP addresses of RostSMU. (National project)	Access from computers university
13.	Single window of access to information resources. - URL: http://window.edu.ru/	Open access
14.	Russian education. Federal educational portal. - URL: http://www.edu.ru/index.php	Open access
15.	ENVOС.RU English vocabulary]: educational site for students English language - URL: http://envoc.ru	Open access
16.	Online dictionaries. - URL: http://dic.academic.ru/	Open access
17.	WordReference.com: online language dictionaries. - URL: http://www.wordreference.com/enru/	Open access
18.	Federal Electronic Medical Library of the Ministry of Health Russia. - URL: http://www.femb.ru/feml/ , http://feml.scsml.rssi.ru	Open access
19.	Medline (PubMed, USA). – URL: https://www.ncbi.nlm.nih.gov/pubmed/	Open access
20.	Free Medical Journals. - URL: http://freemedicaljournals.com	Open access
21.	Free Medical Books. - URL: http://www.freebooks4doctors.com/	Open access
22.	International Scientific Publications. –URL: https://www.scientific-publications.net/ru/	Open access
23.	CyberLeninka: scientific electron. beep. - URL: http://cyberleninka.ru/	Open access
24.	Archive of scientific journals / NEIKON. - URL: https://archive.neicon.ru/xmlui/	Open access
25.	Open access journals in Russian /EIPub platform NEICON. – URL: https://elpub.ru/	Open access
26.	Medical Bulletin of the South of Russia. – URL: https://www.medicalherald.ru/jour or from the RostSMU website	Open access

27.	World Health Organization. - URL: http://who.int/ru/	Open access
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28.	Evrika.ru information and educational portal for doctors. – URL: https://www.evrika.ru/	Open access
29.	Med-Edu.ru : medical video portal. - URL: http://www.med-edu.ru/	Open access
thirti y.	Univadis.ru : international honey. portal. - URL: http://www.univadis.ru/	Open access
31.	DoctorSPB.ru : information-reference portal about medicine. - URL: http://doctorspb.ru/	Open access
32.	Modern problems of science and education : electron. magazine. - URL: http://www.science-education.ru/ru/issue/index	Open access
33.	Rubricator of clinical recommendations Ministry of Health of Russia. - URL: http://cr.rosminzdrav.ru/#!/	Open access
34.	Other Open resources can be found at: http://rostgmu.ru →Library→Electronic catalogue→Open Internet resources→further by keyword...	

6.5. Guidelines for students on mastering the discipline.

An important condition for successfully mastering the discipline “Microbiology, Virology” is the creation of a system of proper organization of work that allows you to distribute the educational load evenly in accordance with the schedule of the educational process. Training consists of classroom lessons, including lectures and practical exercises, and independent work. The main teaching time is allocated to practical classes in microbiology.

When studying an academic discipline, it is necessary to use the ability to navigate various sections of general and specific microbiology and master practical skills: interpretation of the results of microscopic examination of drugs in Gram stain, results of antibiotic sensitivity and resistance, bacteriological, serological and genetic (PCR) studies.

Practical classes are conducted in the form of discussions, demonstrations of smears, bacteriological cultures, videos, multimedia presentations, and the use of visual aids. Solving situational problems, answers to test tasks.

Independent work of students involves preparation for current control and includes preparation for classes and testing in sections of the academic discipline.

Working with educational literature is considered as a type of educational work in the discipline “Microbiology, virology” and is carried out within the hours allocated for its study (in the CPC section).

Each student is provided with access to the library funds of the University and the department.

For each section of the academic discipline, methodological instructions for teachers “Methodological instructions for general and specific microbiology” and methodological recommendations for students “Teaching aids” have been developed:

1. Morphology of microorganisms: educational method. allowance / Yu.L. Naboka, L.I. Vasilyeva, M.L. Chernitskaya [and others]. – Rostov n/d: Rostov State Medical University Publishing House, 2019. – 67 p.

2. Physiology and ecology of microorganisms: educational method. allowance / Yu.L. Naboka, L.I. Vasilyeva, M.L. Chernitskaya [and others]. – Rostov n/d: Publishing house RostGMU, 2019. – 68 p.

The same [Electronic resource]: electronic copy. – Access from EUB RostSMU.

3. The doctrine of infection and immunity. Fundamentals of immunology: educational method. allowance / L.I. Vasilyeva, L.E. Bragina, Yu.L. Naboka [and others]. – Rostov n/d: Publishing house RostGMU, 2018. – 64 p.

The same [Electronic resource]: electronic copy. – Access from EUB RostSMU.

4. Introduction to virology. Bacteriophages. Genetics and variability of bacteria: textbook - method. allowance / Yu.L. Naboka, L.I. Vasilyeva, M.L. Chernitskaya [and others]. – Rostov n/d: Publishing house of Rostov State Medical University, 2019. – 66 p.

The same [Electronic resource]: electronic copy. – Access from EUB RostSMU.

5. Pathogenic cocci and gram-negative bacteria. Pathogens of zoonoses: textbook - method. allowance / L.I. Vasilyeva, L.E. Bragina, Yu.L. Naboka [and others]. – Rostov n/d: Publishing house of Rostov State Medical University, 2020. – 66 p.

The same [Electronic resource]: electronic copy. – Access from EUB RostSMU.

6. Basic bacterial pathology of the gastrointestinal tract: educational method. allowance / Yu.L. Naboka, L.I. Vasilyeva, M.L. Chernitskaya [and others]. – Rostov n/a: Publishing house of Rostov State Medical University, 2020. – 70 p.

The same [Electronic resource]: electronic copy. – Access from EUB RostSMU.

7. Causative agents of diphtheria, tuberculosis. Anaerobic infections. Spirochetoses, chlamydia: educational method. allowance / Yu.L. Naboka, L.I. Vasilyeva, M.L. Chernitskaya [and others]. – Rostov n/d: Rostov State Medical University Publishing House, 2020. – 59 p.

The same [Electronic resource]: electronic copy. – Access from EUB RostSMU.

8. Clinical virology: educational method. allowance / Yu.L. Naboka, L.I. Vasilyeva, M.L. Chernitskaya [and others]. – Rostov n/d: Rostov State Medical University Publishing House, 2020. – 69 p.

The same [Electronic resource]: electronic copy. – Access from EUB RostSMU. Student work in a group develops a sense of teamwork and communication skills.

Teaching students helps develop their communication skills with patients, taking into account the ethical and deontological characteristics of pathology and patients.

The initial level of students' knowledge is determined by testing, the current control of mastering the subject is determined by oral questioning during classes, when solving typical situational problems and answering test tasks.

At the end of studying an academic discipline, an intermediate control of knowledge is carried out using test control, testing practical skills and solving situational problems. When preparing for the intermediate certification, it is advisable to: carefully study the list of questions and determine which sources contain the information necessary to answer them, carefully read the recommended literature and draw up brief notes on the answers (answer plans).

VII. MATERIAL AND TECHNICAL SUPPORT OF DISCIPLINE.

7.1. Educational and laboratory equipment.

Specialized training rooms with a set of equipment for demonstration (boards, microscopes, sets of demonstration microbiological smears, bacteriological loops, test tubes, pipettes, a set of disks with antibiotics, anaerostats). Sets of situational tasks, test tasks for various sections of the discipline.

7.2. Technical and electronic means.

Multimedia complex (laptop, projector, screen) for the presentation of lecture material, film fragments, as well as sets of multimedia visual materials, presentations, slides, tables.

Name of special* premises and premises for independent work	Equipping special rooms and rooms for independent work
344022, Rostov region, Rostov-on-Don Don, per. Nakhichevan, 38/57-59/212-214 (No. 44, Liter S, 2nd floor)	The premises are equipped specialized teaching furniture tables (7), chairs (14), teaching board, sets of demonstration equipment and educational visual aids,

<p>Audience No. 1</p> <p>Classroom for classes practical type discipline</p> <p>"Microbiology, virology", independent work.</p>	<p>providing</p> <p>thematic illustrations: tables (15), microscopes (2), kits</p> <p>demonstration microbiological swabs (2), demonstration material on topics (bacteriological loops, test tubes, pipettes, set of disks with antibiotics, anaerostats) (1)</p>
<p>344022, Rostov region, Rostov-on-Don, lane. Nakhichevansky, 38/57-59/212-214 (No. 44, Liter S, 2nd floor)</p> <p>Audience No. 2</p> <p>Classroom for conducting practical classes in the discipline</p> <p>"Microbiology, virology", independent work.</p>	<p>Room staffed specialized educational furniture tables (8), chairs (16) educational board, sets of demonstration equipment and educational-visual benefits, providing</p> <p>thematic illustrations: tables (15), microscopes (2), kits</p> <p>demonstration microbiological swabs (2), demonstration material on topics (bacteriological loops, test tubes, pipettes, set of disks with antibiotics, anaerostats) (1)</p>
<p>344022, Rostov region, Rostov-on-Don, lane. Nakhichevansky, 38/57-59/212-214 (No. 44, Liter S, 2nd floor)</p> <p>Audience No. 3</p> <p>Classroom for classes practical type, group consultations, consultations individual consultations, ongoing control intermediate certification in discipline</p> <p>"Microbiology, virology."</p>	<p>Room staffed specialized educational furniture tables (8), chairs (16) educational board, sets of demonstration equipment and educational-visual benefits, providing</p> <p>thematic illustrations: tables (15), microscopes (2), kits</p> <p>demonstration microbiological swabs (2), demonstration material on topics (bacteriological loops, test tubes, pipettes, set of disks with antibiotics, anaerostats) (1)</p>

<p>344022, Rostov region, Rostov-on-Don, lane. Nakhichevansky, 38/57-59/212-214 (No. 44, Liter S, 2nd floor)</p> <p>Auditorium No. 4</p> <p>Classroom for classes practical type, group consultations, individual consultations, ongoing monitoring</p>	<p>Room staffed specialized educational furniture tables (8), chairs (16) educational board, sets of demonstration equipment and educational-visual benefits, providing thematic illustrations: tables (15), microscopes (2), kits demonstration microbiological swabs</p>
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<p>intermediate certification in discipline "Microbiology, virology."</p>	<p>demonstration material on topics (bacteriological loops, test tubes, pipettes, set of disks with antibiotics, anaerostats) (1)</p>
<p>344022, Rostov region, Rostov-on-Don, lane. Nakhichevansky, 38/57-59/212-214 (No. 44, Liter S, 2nd floor)</p> <p>Auditorium No. 7</p> <p>Classroom for conducting practical classes in the discipline "Microbiology, virology."</p>	<p>Room staffed specialized educational furniture tables (8), chairs (16) educational board, sets of demonstration equipment and educational-visual benefits, providing</p> <p>thematic illustrations: tables (15), microscopes (2), kits demonstration microbiological swabs (2), demonstration material on topics (bacteriological loops, test tubes, pipettes, set of disks with antibiotics, anaerostats) (1)</p>