

ЛД-16 ИН

«North-Ossetia State Medical Academy»  
of the Ministry of Healthcare of the Russian Federation



APPROVED

Rector of FSBEI HE NOSMA

МОH Russia

O.V. Remizov

“30” March 2022

EDUCATIONAL TRAINING PROGRAM OF DISCIPLINE  
"Clinical laboratory diagnostics"

the main professional educational program of higher education-specialty program in the  
specialty 31.05.01 General Medicine, approved on 30.03.2022

Form of education Full-time

The period of development 6

Department of Biological Chemistry

Vladikavkaz 2022

When developing an educational training program, the discipline is based on:

1. Federal State Educational Standard of Higher Education on specialty 31.05.01 General Medicine, approved by the Ministry of Education and Science of the Russian Federation on February 9, 2016 №95

2. Academic plan on specialty 31.05.01 General Medicine

ЛД-16-02-17 ИИ

ЛД-16-03-18 ИИ

ЛД-16-04-19 ИИ

ЛД-16-05-20 ИИ

3. approved by the Scientific Council of the Federal State Budgetary Educational Institution of Higher Education «North-Ossetia State Medical Academy» of the Ministry of Healthcare of the Russian Federation “30” March 2022, Protocol № 6.

The educational training program of the discipline was approved at a meeting of the department of Biological Chemistry from "14" March 2022, Protocol №. 7

The educational training program of the discipline was approved at a meeting of the central coordinating training and methodological council from "22" March 2022, Protocol №.4

The educational training program of the discipline was approved by the Scientific Council of the State Medical University of the Federal State Budgetary Educational Institution of Higher Education «North-Ossetia State Medical Academy» of the Ministry of Healthcare of the Russian Federation from “30” March 2022, Protocol № 6.

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## Content of the work program

1. the name of the discipline;
2. a list of the planned learning outcomes in the discipline, correlated with the planned results of mastering the educational program;
3. an indication of the place of the discipline in the structure of the educational program;
4. the amount of discipline in credit units, indicating the number of academic or astronomical hours allocated for contact work of students with a teacher (by type of training) and for independent work of students;
5. the content of the discipline, structured by topics (sections) with an indication of the number of academic or astronomical hours allocated for them and types of training;
6. a list of educational and methodological support for independent work of students in the discipline;
7. fund of assessment tools for intermediate certification of students in the discipline;
8. a list of basic and additional educational literature necessary for mastering the discipline;
9. a list of resources of the information and telecommunication network "Internet" (hereinafter referred to as the "Internet" network), necessary for mastering the discipline;
10. guidelines for students on the development of the discipline;
11. a list of information technologies used in the implementation of the educational process in the discipline, including a list of software and information reference systems (if necessary);
12. description of the material and technical base necessary for the implementation of the educational process in the discipline.
13. conducting educational activities using e-learning and distance learning technologies.

1. The name of the discipline.  
"Clinical laboratory diagnostics"

2. The list of planned learning outcomes in the discipline and the results of mastering the educational program

| № п/п | Competence number / index | Content of competence (or part of it)                                                      | Topic of the lesson (section)                                                     | Development results                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                            |
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|       |                           |                                                                                            |                                                                                   | know                                                                                                                                                                                                                                                                                                                 | be able to                                                                                                                                                                                                                  | own                                                                                                                                                                                                                                                                                                        |
| 1     | 2                         | 3                                                                                          | 4                                                                                 | 5                                                                                                                                                                                                                                                                                                                    | 6                                                                                                                                                                                                                           | 7                                                                                                                                                                                                                                                                                                          |
| 1.    | GPC -3                    | Ability to use the foundations of economic and legal knowledge in professional activities. | Organization of laboratory services. Quality control (QC) of laboratory research. | 1. Legislative, regulatory, instructive and methodological documents defining the activities of laboratories of medical organizations and quality management of clinical laboratory research<br>2. Clinical informativeness of laboratory research from the standpoint of evidence-based medicine in the most common | 1. To organize a workplace for morphological (cytological), biochemical, immunological, express methods and other studies;<br>2. Organize the work of nursing staff;<br>3. To organize the work of the laboratory personnel | 1. Skills for performing basic laboratory manipulations (microscopy, dosing, centrifugation, weighing, filtration of solutions, preparation of solutions of substances, etc.)<br>2. Preparation, fixation and staining of preparations for microscopic examination, preparation of samples for biochemical |



|  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                         |
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|  |  |  |  | <p>diseases of the cardiovascular, respiratory, digestive, genitourinary, musculoskeletal, nervous, immune, endocrine systems and blood;</p> <p>3. Basic modern preanalytical and analytical technologies of clinical laboratory research.</p> <p>4. principles of operation and rules of operation of the main types of measuring instruments, analyzers and other equipment used in the performance of clinical laboratory research;</p> <p>5. Factors influencing the results of laboratory</p> | <p>;</p> <p>4. Prepare a preparation for microscopic examination, samples of biomaterial for biochemical, immunological and other laboratory studies;</p> <p>5. Prepare solutions of reagents, dyes for laboratory research;</p> <p>6. Work on the most common laboratory measuring instruments, analyzers and equipment in accordance with the rules of their operation;</p> <p>6. Maintaining accounting and reporting documentation of the laboratory (registration of a journal for recording</p> | <p>immunological and other studies;</p> <p>3. Carrying out the calibration of laboratory measuring instruments;</p> <p>4. Work on the most common laboratory measuring instruments, analyzers and equipment in accordance with the rules of their operation;</p> <p>5. Execution of laboratory tests by non-device express methods;</p> |
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|  |  |  |  | <p>research at the preanalytical, analytical and postanalytical stages;</p> <p>6. Technology for organizing and conducting internal and external quality control of clinical laboratory research.</p> | <p>rules of their operation;</p> <p>7. Carry out quality control of the analytical stage of the research performed;</p> <p>8. To organize the performance of laboratory research in accordance with the requirements for labor protection, sanitary and epidemiological requirements;</p> <p>9. To carry out the most common express methods of laboratory</p> | <p>research results, filling out forms for analysis results, etc.).</p> |
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|    |       |                                                    |                                                                                                     |                                                                                                                                                                                                                                                                                                         | research;<br>10. To<br>issue<br>accountin<br>g and<br>reporting<br>document<br>ation for<br>clinical<br>laborator<br>y<br>research,<br>provided<br>for by the<br>current<br>regulator<br>y<br>document<br>s.                                  |                                                                                                                                                                                                                                                          |
| 2. | GPC-6 | Readiness<br>to<br>maintain<br>medical<br>records. | Organization<br>of laboratory<br>services.<br>Quality<br>control (QC)<br>of laboratory<br>research. | 1.Rules of<br>primary<br>health care<br>as a type of<br>health care<br>in the health<br>care system;<br>2. Methods<br>for<br>laboratory<br>examination<br>in the<br>prevention<br>of diseases,<br>clinical<br>examination<br>of patients<br>with chronic<br>diseases,<br>medical<br>rehabilitatio<br>n, | 1.<br>Perform<br>clinical<br>laborator<br>y studies<br>and use<br>methods -<br>express<br>diagnosti<br>cs aimed<br>at<br>identifyin<br>g the risk<br>of<br>developin<br>g<br>diseases;<br>2. To<br>carry out<br>measures<br>to prevent<br>the | 1. The<br>technology<br>for<br>performing<br>the most<br>common<br>types of<br>general<br>clinical,<br>biochemical<br>,<br>coagulologi<br>cal,<br>hematologic<br>al,<br>parasitologi<br>cal,<br>immunologi<br>cal and<br>cytological<br>studies<br>using |

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|  |  |  |  | <p>monitoring the course of pregnancy;</p> <p>3. Fundamentals of the organization and provision of emergency and urgent care, including the organization and provision of laboratory and diagnostic assistance;</p> <p>4. Fundamentals of social hygiene and public health of the population of the country, the tasks of the country's health care in the field of health protection of the population and the</p> | <p>spread of infectious and parasitic diseases, to comply with sanitary norms and rules when working with biological material;</p> <p>3. Conduct sanitary and educational work on the prevention of infectious and non-infectious diseases.</p> | <p>laboratory equipment and information systems;</p> <p>2. Technology for performing laboratory express research;</p> <p>3. Technology for organizing and performing quality control of laboratory research;</p> <p>4. Methods for drawing up a plan for laboratory examination of patients and interpreting the results of laboratory tests at the stages of prevention, diagnosis and treatment of</p> |
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|    |       |                                                       |                                                                            | prospects for the development of health care.        |                                           | the most common diseases of the cardiovascular, respiratory, digestive, genitourinary, musculoskeletal, nervous, immune, endocrine systems, blood, as well as emergency states; 5. The technology of interaction with the staff of clinical departments on the issues of laboratory examination of patients. |
| 3. | GPC-9 | The ability to assess morphofunctional, physiological | Hematological examinations Express methods in hematology. General clinical | 1. Diagnostic informativeness of laboratory symptoms | 1. To carry out clinical laboratory tests | 1. Interpreting the results of laboratory tests; 2.                                                                                                                                                                                                                                                          |

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|    |      | conditions and pathological processes in the human body for solving professional problems.                         | research methods Laboratory diagnostics of parasitic diseases. Clinical biochemistry. Methods of modern express diagnostics. Coaguagulology. Immunological studies. ELISA research in the CDL. Methods of modern express diagnostics. Molecular genetic research methods Cytological studies Bacteriological research methods | and syndromes - the concept of specificity, test sensitivity, predictive value; list of laboratory methods, taking into account the organizational structure of healthcare institutions                | and express methods aimed at identifying the risk of developing diseases; 2. Interpret the results of the most common laboratory diagnostic methods | Algorithm for a detailed clinical diagnosis; 3. Algorithm for making a preliminary diagnosis with subsequent referral to the appropriate specialist doctor. |
| 4. | PC-2 | Ability and readiness to conduct preventive medical examinations, clinical examination and dispensary observation. | Hematological research. General clinical research methods. Laboratory diagnosis of parasitic diseases. Clinical biochemistry. Methods of modern express diagnostics. Coaguagulology. Immunological studies ELISA studies in                                                                                                   | 1. Rules of primary health care as a type of health care in the health care system; 2. Methods for laboratory examination in the prevention of diseases, clinical examination of patients with chronic | 1. Perform clinical laboratory studies and use methods - express diagnostics aimed at identifying the risk of developing                            | 1. The technology for performing the most common types of general clinical, biochemical, coagulological, hematological, parasitologi                        |

|  |  |  |                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                             |
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|  |  |  | <p>CDL. Methods of modern express diagnostics. Molecular genetic research methods</p> <p>Cytological studies</p> <p>Bacteriological research methods modern express diagnostics.</p> | <p>diseases, medical rehabilitation, monitoring the course of pregnancy;</p> <p>3. Fundamentals of the organization and provision of emergency and urgent care, including the organization and provision of laboratory and diagnostic assistance;</p> <p>4. Fundamentals of social hygiene and public health of the population of the country, the tasks of the country's health care in the field of health protection of the population and the prospects</p> | <p>diseases;</p> <p>2. To carry out measures to prevent the spread of infectious and parasitic diseases, to comply with sanitary norms and rules when working with biological material;</p> <p>3. Conduct sanitary and educational work on the prevention of infectious and non-infectious diseases.</p> | <p>cal, immunological and cytological studies using laboratory equipment and information systems;</p> <p>2. Technology for performing laboratory express research;</p> <p>3. Technology for organizing and performing quality control of laboratory research;</p> <p>4. Methods for drawing up a plan for laboratory examination of patients and interpreting the results of laboratory</p> |
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|  |  |  |  | for the development of health care. |  | tests at the stages of prevention, diagnosis and treatment of the most common diseases of the cardiovascular, respiratory, digestive, genitourinary, musculoskeletal, nervous, immune, endocrine systems, blood, as well as emergency states;<br>5. The technology of interaction with the staff of clinical departments on the issues of laboratory examination of patients. |
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| 5. | PC-3 | <p>The ability and readiness to carry out anti-epidemic measures, the organization of protection of the population in the centers of especially dangerous infections, when the radiation situation worsens, natural disasters and other emergencies.</p> | <p>Hematological examinations<br/>Express methods in hematology.<br/>General clinical research methods.<br/>Laboratory diagnostics of parasitic diseases.<br/>Clinical biochemistry.<br/>Methods of modern express diagnostics.<br/>Immunological studies ELISA studies in the CDL.<br/>Methods of modern express diagnostics<br/>Coagulology.<br/>Molecular genetic research methods<br/>Cytological studies<br/>Bacteriological research methods</p> | <p>1. Rules of action upon detection of a patient with signs of especially dangerous infections; organization and volume of first aid in military field conditions, in case of mass casualties of the population and catastrophes ;<br/>3. Rules of first aid for life-threatening and emergency conditions;<br/>4. Fundamentals of radiation safety;<br/>5. Fundamentals of disease prevention and health education;<br/>6. Rules of action when a patient is found with</p> | <p>1. To organize a workplace for morphological (cytological), biochemical, immunological, express methods and other studies;<br/>2. Organize the work of nursing staff;<br/>3. To organize the work of the laboratory personnel ;<br/>4. Prepare a preparation for microscopic examination, samples of biomaterial for biochemical</p> | <p>1. Skills for performing basic laboratory manipulations (microscopy, dosing, centrifugation, weighing, filtration of solutions, preparation of solutions of substances, etc.)<br/>2. Preparation, fixation and staining of preparations for microscopic examination, preparation of samples for biochemical, immunological and other studies;<br/>3. Carrying out the calibration of laboratory measuring instruments;<br/>4. Work on the most common</p> |
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|  |  |  |  | signs of especially dangerous infections. | cal, immunological and other laboratory studies; 5. Prepare solutions of reagents, dyes for laboratory research; 6. Work on the most common laboratory measuring instruments, analyzers and equipment in accordance with the rules of their operation; be able to use methods of express diagnostics in a laboratory; 7. Carry out | laboratory measuring instruments, analyzers and equipment in accordance with the rules of their operation; 5. Execution of laboratory tests by non-device express methods; 6. Maintaining accounting and reporting documentation of the laboratory (registration of a journal for recording research results, filling out forms for analysis results, etc.). |
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|  |  |  |  |  | <p>quality control of the analytical stage of the research performed;</p> <p>8. To organize the performance of laboratory research in accordance with the requirements for labor protection, sanitary and epidemiological requirements;</p> <p>9. Perform the most common laboratory tests and use the methods of modern express diagnostics;</p> |  |
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|    |      |                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                              | 10. To issue accounting and reporting documentation for clinical laboratory research, provided for by the current regulatory documents.                                    |                                                                                                                                                                                                                 |
| 6. | PC-5 | Willingness to collect and analyze patient complaints, data from his anamnesis, examination results, laboratory, instrumental, pathological and anatomical and other studies in order to recognize a condition or establish the | Hematological examinations Express methods in hematology. General clinical research methods. Laboratory diagnostics of parasitic diseases. Clinical biochemistry. Methods of modern express diagnostics. Immunological studies. ELISA research in the CDL. Methods of modern express diagnostics. Coagulology. Molecular genetic | 1. Diagnostic informativeness of laboratory symptoms and syndromes - the concept of specificity, test sensitivity, predictive value; list of laboratory methods, taking into account the organizational structure of healthcare institutions | 1. To carry out clinical laboratory tests and express methods aimed at identifying the risk of developing diseases; 2. Interpret the results of the most common laboratory | 1. Interpreting the results of laboratory tests; 2. Algorithm for a detailed clinical diagnosis; 3. Algorithm for making a preliminary diagnosis with subsequent referral to the appropriate specialist doctor. |

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|    |       | presence or absence of a disease.                                                                                                                 | research methods<br>Cytological studies<br>Bacteriological research methods<br><br>1. Diagnostic informativeness of laboratory symptoms and syndromes - the concept of specificity, test sensitivity, predictive value; list of laboratory methods, taking into account the organizational structure of healthcare institutions |                                                                                                                                                                                     | y<br>diagnostic methods                                                                                                    |                                                                                                                                                                               |
| 7. | PC-17 | Ability to apply the basic principles of organization and management in the field of public health protection, in medical organizations and their | Organization of laboratory services.<br>Quality control (QC) of laboratory research.                                                                                                                                                                                                                                            | 1. Legislative, regulatory, instructive and methodological documents defining the activities of laboratories of medical organizations and quality management of clinical laboratory | 1. To organize a workplace for morphological (cytological), biochemical, immunological, express methods and other studies; | 1. Skills for performing basic laboratory manipulations (microscopy, dosing, centrifugation, weighing, filtration of solutions, preparation of solutions of substances, etc.) |

|  |  |                   |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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|  |  | structural units. |  | <p>research</p> <p>2. Clinical informativeness of laboratory research from the standpoint of evidence-based medicine in the most common diseases of the cardiovascular, respiratory, digestive, genitourinary, musculoskeletal, nervous, immune, endocrine systems and blood;</p> <p>3. Basic modern preanalytical and analytical technologies of clinical laboratory research.</p> <p>4. principles of operation and rules of operation of the main types of measuring</p> | <p>2. Organize the work of nursing staff;</p> <p>3. To organize the work of the laboratory personnel ;</p> <p>4. Prepare a preparation for microscopic examination, samples of biomaterial for biochemical, immunological and other laboratory studies;</p> <p>5. Prepare solutions of reagents, dyes for laboratory research;</p> <p>6. Work on the most</p> | <p>2. Preparation, fixation and staining of preparations for microscopic examination , preparation of samples for biochemical , immunological and other studies;</p> <p>3. Carrying out the calibration of laboratory measuring instruments;</p> <p>4. Work on the most common laboratory measuring instruments, analyzers and equipment in accordance with the rules of their operation;</p> <p>5. Execution of laboratory tests by non-device express</p> |
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|  |  |  |  | <p>instruments, analyzers and other equipment used in the performance of clinical laboratory research;</p> <p>5. Factors influencing the results of laboratory research at the preanalytical, analytical and postanalytical stages;</p> <p>6. Technology for organizing and conducting internal and external quality control of clinical laboratory research.</p> | <p>common laboratory measuring instruments, analyzers and equipment in accordance with the rules of their operation;</p> <p>7. Carry out quality control of the analytical stage of the research performed;</p> <p>8. To organize the performance of laboratory research in accordance with the requirements for labor protection, sanitary and</p> | <p>methods;</p> <p>6. Maintaining accounting and reporting documentation of the laboratory (registration of a journal for recording research results, filling out forms for analysis results, etc.).</p> |
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|    |       |                                                                                |                                                                                                                                           |                                                                                             | epidemiological requirements;<br>9. To carry out the most common express methods of laboratory research;<br>10. To issue accounting and reporting documentation for clinical laboratory research, provided for by the current regulatory documents. |                                                                             |
| 8. | PC-22 | Willingness to participate in the implementation of new methods and techniques | Hematological examinations<br>Express methods in hematology.<br>General clinical research methods.<br>Laboratory diagnostics of parasitic | 1. Rules of safety precautions and work in a clinical diagnostic laboratory, with reagents, | 1. Work on the most common laboratory measuring instruments                                                                                                                                                                                         | 1. The technology for performing the most common types of general clinical, |

|  |  |                                                    |                                                                                                                                                                                                                                                                               |                 |                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                      |
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|  |  | <p>aimed at protecting the health of citizens.</p> | <p>diseases. Clinical biochemistry. Methods of modern express diagnostics. Immunological studies. ELISA research in the CDL. Methods of modern express diagnostics. Coagulology. Molecular genetic research methods Cytological studies Bacteriological research methods.</p> | <p>devices.</p> | <p>ts, analyzers and equipment in accordance with the rules of their operation, as well as be able to use the methods of modern express diagnostics.</p> | <p>biochemical , coagulological, hematological, parasitological, immunological and cytological studies using laboratory equipment and information systems and methods of modern express diagnostics;</p> <p>2. Technology for performing laboratory express research;</p> <p>3. Technology for organizing and performing quality control of laboratory research;</p> |
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|  |  |  |  |  |  | <p>4.Methods drawing up a plan for laboratory examination of patients and interpreting the results of laboratory tests at the stages of prevention, diagnosis and treatment of the most common diseases of the cardiovascular, respiratory, digestive, genitourinary, musculoskeletal, nervous, immune, endocrine systems, blood, as well as in emergency conditions</p> |
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3. Place of discipline in the structure of the educational program  
The discipline "Clinical laboratory diagnostics" is a discipline of the part, formed by the participants of educational relations of the Block 1 of the Federal State Educational Standard of Higher Education in the specialty 31.05.01 "General Medicine".

#### 4. Scope of the discipline

| №п/п | Type of work                                                         | Total credits | Total hours | Semester        |
|------|----------------------------------------------------------------------|---------------|-------------|-----------------|
|      |                                                                      |               |             | 10              |
|      |                                                                      |               |             | Number of hours |
| 1    | 2                                                                    | 3             | 4           | 5               |
| 1.   | <b>Contact work of students with the teacher (total), including:</b> | 72            | 72          | 72              |
| 2.   | Lectures (L)                                                         | 14            | 14          | 14              |
| 3.   | Clinical Practices (CL)                                              | 58            | 58          | 58              |
| 4.   | Seminars (S)                                                         |               |             |                 |
| 5.   | Laboratory work (LW)                                                 |               |             |                 |
| 6.   | <b>Student independent work (SIW)</b>                                | 36            | 36          | 36              |
| 7.   | <b>Intermediate type appraisals</b>                                  | offset(O)     | 3           |                 |
|      |                                                                      | exam (E)      |             |                 |
| 8.   | <b>TOTAL: General labor intensity</b>                                | <b>hours</b>  | 108         | 108             |
|      |                                                                      | <b>3ET</b>    | 3           | 3               |

#### 5. Content of the discipline

| №/п | № semester | The name of the topic (section) of the discipline | Types of educational activities (in hours) |    |   |     |       | Forms of monitoring of progress |
|-----|------------|---------------------------------------------------|--------------------------------------------|----|---|-----|-------|---------------------------------|
|     |            |                                                   | L                                          | LW | S | SIW | Total |                                 |
| 1   | 2          | 3                                                 | 4                                          | 5  | 6 | 7   | 8     | 9                               |

|    |    |                                                                                      |   |  |    |    |    |                                                                                                                                        |
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| 1  | 12 | Organization of laboratory services.<br>Quality control (QC) of laboratory research. | 2 |  | 7  | 4  | 13 | Solving situational tasks; test control with elements of visual identification, written survey, interview on situational tasks, module |
| 2  | 12 | Hematological examinations.<br>Express methods in hematology.                        | 2 |  | 5  | 2  | 9  | Solving situational tasks; test control with elements of visual identification, written survey, interview on situational tasks, module |
| 3. | 12 | General clinical research methods.<br>Laboratory diagnostics of parasitic diseases.  | 2 |  | 20 | 10 | 32 | Solving situational tasks; test control with elements of visual identification, written survey, interview on situational tasks, module |
| 4. | 12 | Clinical biochemistry.<br>Methods of modern express diagnostics.                     | 2 |  | 10 | 8  | 20 | Solving situational tasks; test control with elements of visual identification, written survey, interview on situational tasks         |

|    |    |                                                                                                      |    |  |    |    |     |                                                                                                                                                        |
|----|----|------------------------------------------------------------------------------------------------------|----|--|----|----|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5. | 12 | Coagulology<br>Methods of modern<br>express diagnostics.                                             | 2  |  | 3  | 2  | 7   | Solving<br>situational tasks;<br>test control with<br>elements of<br>visual<br>identification,<br>written survey,<br>interview on<br>situational tasks |
| 6. | 12 | Immunological studies.<br>ELISA research in the<br>CDL.<br>Methods of modern<br>express diagnostics. | 2  |  | 5  | 4  | 11  | Solving<br>situational tasks;<br>test control with<br>elements of<br>visual<br>identification,<br>written survey,<br>interview on<br>situational tasks |
| 7. | 12 | Molecular genetic<br>research methods.<br>Cytological studies.<br>Bacteriological research           | 2  |  | 8  | 6  | 16  | Solving<br>situational tasks;<br>test control with<br>elements of<br>visual<br>identification,<br>written survey,<br>interview on<br>situational tasks |
|    |    | TOTAL:                                                                                               | 14 |  | 58 | 36 | 108 |                                                                                                                                                        |

#### 6.The list of educational and methodological support for independent work of students in the discipline

| №/п | № семестра | Наименование учебно-методической разработки                                                                                                                                                                                                                                |
|-----|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.  | 12         | <p>1. Клиническая лабораторная диагностика.<br/>Национальное руководство. В.В. Долгов, В.В. Меньшиков.<br/>Том I. Москва. 2013</p> <p>2. Гематологические анализаторы. Интерпретация анализа крови.<br/>Методические рекомендации. С. А. Луговская, М.Е. Почтарь, В.В.</p> |

|    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |    | <p>Долгов. Москва. 2008</p> <p>3. Клиническое руководство Тица по лабораторным тестам. Алан Г.Б.Ву, DABCC, FACB. Москва. 2013</p>                                                                                                                                                                                                                                                                                                             |
| 2. | 12 | <p>1. Клиническая лабораторная диагностика.<br/>Национальное руководство. В.В. Долгов, В.В. Меньшиков.<br/>Том I, II. Москва. 2013</p> <p>2. Гематологические анализаторы. Интерпретация анализа крови. Методические рекомендации. С. А. Луговская, М.Е. Почтарь, В.В. Долгов. Москва. 2008.</p> <p>3. Лабораторная гематология.<br/>3. Клиническое руководство Тица по лабораторным тестам. Алан Г.Б.Ву, DABCC, FACB. Москва. 2013</p>       |
| 3. | 12 | <p>1 . Клиническая лабораторная диагностика.<br/>Национальное руководство. В.В. Долгов, В.В. Меньшиков.<br/>Том I, II. Москва. 2013</p> <p>2. Спинномозговая жидкость, лабораторные методы исследования и их клинико-диагностическое значение. Учебное пособие. С.Г. Марданлы, Ю.В. Первушин, В.Н. Иванова. г. Электрогорск, 2012.</p> <p>3. Клиническое руководство Тица по лабораторным тестам. Алан Г.Б.Ву, DABCC, FACB. Москва. 2013.</p> |
| 4. | 12 | <p>1.Пособие по биохимическим исследованиям в клинико-диагностических лабораториях.. Ю.В. Первушин, С.Ш. Рогова. Ставрополь, 2008.</p> <p>2. Клиническая лабораторная диагностика.<br/>Национальное руководство. В.В. Долгов, В.В. Меньшиков.<br/>Том I. Москва. 2013</p> <p>3. Клиническое руководство Тица по лабораторным тестам. Алан Г.Б.Ву, DABCC, FACB. Москва. 2013</p>                                                               |
| 5. | 12 | <p>1.Лабораторная диагностика нарушений системы гемостаза. Учебное пособие. И.А. Волкова. Москва. 2013</p>                                                                                                                                                                                                                                                                                                                                    |



|    |    |                                                                                                                                                                                                                                                                                                                                                                                         |
|----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |    | <p>1.Лабораторная диагностика неотложных состояний. А.А. Кишкун. Москва. 2012.</p> <p>2.Клиническая лабораторная диагностика.Национальное руководство. В.В. Долгов, В.В. Меньшиков.Том I. Москва. 2013.</p> <p>3.Клиническое руководство Тица по лабораторным тестам. Алан Г.Б.Ву, DABCC, FACB. Москва. 2013.</p>                                                                       |
| 6. | 12 | <p>1 . Клиническая лабораторная диагностика.<br/>Национальное руководство. В.В. Долгов, В.В. Меньшиков.<br/>Том I, II. Москва. 2013.</p> <p>2.Клиническое руководство Тица по лабораторным тестам. Алан Г.Б.Ву, DABCC, FACB. Москва. 2013.</p> <p>3. Иммунологические исследования и методы диагностики инфекционных заболеваний в клинической практике. А.А. Кишкун. Москва, 2009.</p> |
| 7. | 12 | <p>1 . Клиническая лабораторная диагностика.<br/>Национальное руководство. В.В. Долгов, В.В. Меньшиков.<br/>Том I, II. Москва. 2013.</p> <p>2. Клиническое руководство Тица по лабораторным тестам. Алан Г.Б.Ву, DABCC, FACB. Москва. 2013.</p> <p>3. ПЦР в реальном времени. Д.В. Ребрикова. Москва. 2015.</p>                                                                         |

#### 7. Fund of assessment tools for intermediate certification of students in the discipline

| №/<br>п | List of competencies                                              | № semester | Indicator (s) evaluating                                                                                   | Evaluation criterion (s)                                                                                                              | Grading scale                                                                      | Name FES                                                     |
|---------|-------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------|
| 1       | 2                                                                 | 3          | 4                                                                                                          | 5                                                                                                                                     | 6                                                                                  | 7                                                            |
| 1.      | GPC-3<br>GPC-6<br>GPC-9<br>PC-2<br>PC-3<br>PC-5<br>PC-17<br>PC-22 | 12         | see the standard for assessing the quality of education, approved. By order of the Federal State Budgetary | see the standard for assessing the quality of education, approved. By order of the Federal State Budgetary Educational Institution of | see the standard for assessing the quality of education, approved. By order of the | Test control. Situational task interview. Tickets for offset |

|  |  |  |                                                                                                                            |                                                                                             |                                                                                                                                                  |  |
|--|--|--|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  |  |  | Educational Institution of Higher Education of the SOGMA of the Ministry of Health of Russia dated 10.07.2018, No. 264 / o | Higher Education of the SOGMA of the Ministry of Health of Russia from 10.07.2018 № 264 / o | Federal State Budgetary Educational Institution of Higher Education of the SOGMA of the Ministry of Health of Russia from 10.07.2018 No. 264 / o |  |
|--|--|--|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--|

**8. Перечень основной и дополнительной учебной литературы, необходимой для освоения дисциплины**

| п/№                        | Наименование                                    | Автор (ы)         | Год, место издания      | Кол-во экземпляров |                                                                                                                                                   |
|----------------------------|-------------------------------------------------|-------------------|-------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |                                                 |                   |                         | в биб-лиотеке      | на кафедре                                                                                                                                        |
| 1                          | 2                                               | 3                 | 4                       | 5                  | 6                                                                                                                                                 |
| <b>Основная литература</b> |                                                 |                   |                         |                    |                                                                                                                                                   |
| 6.                         | Руководство по лабораторным методам диагностики | ред. А.А. Кишкун  | М. : ГЭОТАР-Медиа, 2007 | 12                 |                                                                                                                                                   |
| 7.                         | Клиническая биохимия: учеб. пособие             | ред. В. А. Ткачук | М. : ГЭОТАР-Медиа, 2006 | 106                | «Консультант студента»<br><a href="http://www.studmedlib.ru/book/ISBN9785970407332.html">http://www.studmedlib.ru/book/ISBN9785970407332.html</a> |
| 8.                         | Клиническая лабораторная                        | Кишкун А. А.      | М. : ГЭОТАР-            | 10<br>2            |                                                                                                                                                   |

|                           |                                                                                         |                                |                         |                                                                                                                                                       |  |
|---------------------------|-----------------------------------------------------------------------------------------|--------------------------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                           | диагностика :<br>учеб. пособие                                                          |                                | Медиа,<br>2013<br>2015  | «Консультант студента»<br><br><a href="http://www.studmedlib.ru/book/ISBN9785970435182.html">http://www.studmedlib.ru/book/ISBN9785970435182.html</a> |  |
| Дополнительная литература |                                                                                         |                                |                         |                                                                                                                                                       |  |
| 1.                        | Клиническая лабораторная диагностика: справочник для врачей                             | Медведев В. В.<br>Волчек Ю. З. | СПб. : Гиппократ , 1997 | 1                                                                                                                                                     |  |
| 1.                        | Справочник по клинико-биохимической лабораторной диагностике в 2 т.                     | Камышиных В. С.                | Минск : Беларусь, 2000  | T.1-2<br>T.2-2                                                                                                                                        |  |
| 2.                        | Терапевтический справочник Вашингтонского университета                                  | ред. Ч. Кэри                   | М. : Практика, 2000     | 2                                                                                                                                                     |  |
| 3.                        | Клинико-лабораторная диагностика инфекционных болезней: Рук-во для врачей               | ред. Ю. В. Лобзин              | СПб. : Фолиант, 2001    | 21                                                                                                                                                    |  |
| 4.                        | Биохимические методы исследования в клинико-диагностических лабораториях: учеб. пособие | О.А. Тимин и др.               | Томск : STT, 2002       | 1                                                                                                                                                     |  |
| 6.                        | Лабораторно-клиническая диагностика                                                     | Бондарь Т. П.<br>Козинец       | М. : МИА, 2003          | 3                                                                                                                                                     |  |

|     |                                                                                                         |                                                              |                                      |   |  |
|-----|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------|---|--|
|     | сахарного<br>диабета и его<br>осложнений                                                                | Г. И.                                                        |                                      |   |  |
| 7.  | Погорелов, В.<br>М.<br>Лабораторно-<br>клиническая<br>диагностика<br>анемий                             | Погорело<br>в В. М.<br>Козинец<br>Г. И.<br>Ковалева<br>Л. Г. | М. : МИА,<br>2004                    | 1 |  |
| 8.  | Таранов, А. Г.<br><br>Лабораторная<br>диагностика в<br>акушерстве и<br>гинекологии:<br>Справочник       | Таранов<br>А. Г.                                             | М. :<br>ЭликсКом<br>, 2004           | 1 |  |
| 9.  | Российский<br>терапевтическ<br>ий<br>справочник (с<br>приложениям<br>и на компакт-<br>диске)            | ред. А. Г.<br>Чучалин                                        | М. :<br>ГЭОТАР-<br>Медиа,<br>2005    | 5 |  |
| 10. | Внутренние<br>болезни.<br>Лабораторная<br>и<br>инструментал<br>ьная<br>диагностика :<br>учеб. пособие   | Ройтберг<br>Г. Е.<br>Струтын<br>ский А.<br>В.                | М. :<br>МЕДпрес<br>с-информ,<br>2011 | 2 |  |
| 11. | Клиническая<br>микробиологи<br>я :<br>руководство<br>для<br>специалистов<br>клинической<br>лабораторной | Донецкая<br>Э. Г.-А.                                         | М. :<br>ГЭОТАР-<br>Медиа,<br>2011    | 1 |  |

|     |                                                                                                                |                                 |                                    |        |  |
|-----|----------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------------|--------|--|
|     | диагностики                                                                                                    |                                 |                                    |        |  |
| 12. | Клиническая лабораторная диагностика: национальное руководство: в 2 т. Т.1                                     | ред. В. В. Долгов               | М. : ГЭОТАР-Медиа, 2012            | 1      |  |
| 13. | Медицинская лабораторная диагностика: программы и алгоритмы : руководство для врачей                           | ред. А. И. Карпищенко           | М. : ГЭОТАР-Медиа, 2014            | 1      |  |
| 14. | Методы клинических лабораторных исследований                                                                   | ред. В. С. Камышников           | М. : МЕДпресс-информ, 2015<br>2016 | 1<br>2 |  |
| 15. | Биохимический диагноз (физиологическая роль и диагностическое значение биохимических компонентов крови и мочи) | Бородин Е. А.<br>Бородина Г. П. | Благовещенск, 2010                 | 1      |  |

|     |                                                                                                      |                                   |                            |    |                                                                                                       |
|-----|------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------|----|-------------------------------------------------------------------------------------------------------|
| 16  | Клинический анализ лабораторных исследований в<br><br>практике военного врача                        | Капитаненко А. М.<br>Дочкин И. И. | М. : Воениздат , 1985      | 1  |                                                                                                       |
| 17. | Лабораторные методы исследования в клинике : справочник                                              | ред. В. В. Меньшиков              | М. : Медицина , 1987       | 10 |                                                                                                       |
| 18. | Руководство к практическим занятиям по клинической лабораторной диагностике                          | ред. М.А. Базарнов а              | Киев : Выща шк., 1988      | 18 |                                                                                                       |
| 19. | Руководство к практическим занятиям по методам клинических лабораторных исследований : Учеб. Пособие | Ронин В. С.<br>Старобинец Г. М.   | М. : Медицина , 1989       | 3  |                                                                                                       |
| 20. | Гематологический атлас                                                                               | Абрамов М. Г.                     | М. : Медицина , 1979, 1985 | 15 |                                                                                                       |
| 21. | Пособие по клинической биохимии для системы                                                          | Никулин Б. А.                     | М. : ГЭОТАР-Медиа, 2007    | 7  | «Консультант студента»<br><a href="http://www.studmedlib.ru/book/">http://www.studmedlib.ru/book/</a> |
|     |                                                                                                      |                                   |                            |    |                                                                                                       |

|  |                                                                                |  |  |                |
|--|--------------------------------------------------------------------------------|--|--|----------------|
|  | послевузовск<br>ого<br>профессионал<br>ьного<br>образования :<br>учеб. пособие |  |  | 970403587.html |
|--|--------------------------------------------------------------------------------|--|--|----------------|



## 9. The list of resources of the information and telecommunications network "Internet" necessary for mastering the discipline

### *Hematology*

<http://dic.academic.ru/>

### *Biochemistry*

<http://biokhimija.ru/klinicheskajabiohimija.html>

[http://bono-esse.ru/blizzard/Lab/KAK/analizator\\_metod\\_recomend\\_2.html](http://bono-esse.ru/blizzard/Lab/KAK/analizator_metod_recomend_2.html)

<http://www.proflit.ru/journals/172/>

### *Immunology*

[http://6years.net/index.php?do=static&page=immunologija\\_allergologija](http://6years.net/index.php?do=static&page=immunologija_allergologija)

<http://medstudents.ru/category/immunology/immtextbooks/>

<http://an.yandex.ru/count/>

[www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov).

[www.qiagtn.com](http://www.qiagtn.com).

<http://www.bestpravo.ru/sss/eh-postanovlenija/z1r.htm>

<http://medlib.tomsk.ru/node/>

### *Quality control in KDL*

[www.fsvok.ru](http://www.fsvok.ru)

## 10. Methodical instructions for students on mastering the discipline

Training in the discipline "Clinical laboratory diagnostics" consists of contact work (72 hours), including a lecture course (14 hours) and practical classes (58 hours) and independent work (36 hours). The main study time is devoted to the practical part of the study of this discipline.

The practical activity of a doctor of any specialty is associated with the need for information about the state of the vital processes of individual organs and tissues, as well as the patient's body as a whole. The subject of laboratory medicine is the receipt and provision for clinical use of information about the composition (chemical and cellular) of biomaterials and changes that are evidence-based causal relationships with certain pathological processes and conditions in the human body. To study the discipline "Clinical laboratory diagnostics" you need knowledge, skills and abilities formed by previous disciplines, such as biology, chemistry, biological chemistry, normal physiology, histology, microbiology, virology, immunology.

Practical classes are conducted on the basis of the clinical diagnostic laboratory of the SOGMA Clinical Hospital, which contributes to a better understanding of all stages of the laboratory's work: preanalytical - including the collection of biological material; for the analytical one - a demonstration of the actually working automated analyzers, which makes it possible to visually evaluate the obtained laboratory tests and understand the quality control issues carried out by the laboratory; postanalytic - the interpretation of research results and the formation, ultimately, of clinical laboratory thinking.



The ability to conduct practical classes in an existing laboratory, the use of visual aids, solving situational problems, independent work with laboratory research ultimately strengthens the theoretical course in mastering the discipline. In accordance with the requirements of the Federal State Educational Standard of Higher Education, active and interactive forms of conducting classes are widely used in the educational process (situational tasks, independent extracurricular work, developing learning in the form of role-playing games, informatization training, individual work with laboratory research and the interpretation of research results). The proportion of classes conducted in interactive forms is at least 5% of classroom lessons.

#### **11. The list of information technologies used in the implementation of the educational process in the discipline**

Educational technologies used in the study of this discipline at least 5% interactive lessons on the volume of classroom lessons. Examples of interactive forms and methods of conducting classes:

- imitation technologies: role-playing games ("Methods of express diagnostics in a clinical laboratory. The work of a KDL doctor when performing express studies"), training ("Interpretation of the results of a biochemical analysis study in case of lipid metabolism disorders");

- non-imitation technologies: lecture (problematic - "Differential diagnosis of iron deficiency anemia and anemia of chronic diseases"), discussion ("The role and functions of cells of the phagocytic system").

The use of a clinical diagnostic laboratory, laboratory and instrumental equipment, classrooms for the work of students.

#### **The list of material and technical means of the classroom for lecturing on biochemistry. Requirements for the equipment of workplaces**

| №  | Наименование                          | Количество |
|----|---------------------------------------|------------|
| 1. | Мультимедийная установка              | 1          |
| 2. | Экран                                 | 1          |
| 3  | Указка лазерная                       | 1          |
| 4. | Звукоусиливающая аппаратура (колонки) | 1          |

#### **The list of material and technical means of the classroom (per academic group) for practical training.**

| №  | Наименование                                                     | Количество |
|----|------------------------------------------------------------------|------------|
|    | <b>Технические средства обучения</b>                             |            |
| 1. | Тематические комплект иллюстраций по разделам учебной дисциплины | 1          |
| 2. | Комплекты слайдов, таблиц.                                       | 1          |
|    | <b>Лабораторное оборудование</b>                                 |            |
| 1. | Холодильник                                                      | 1          |

|                     |                                             |     |
|---------------------|---------------------------------------------|-----|
| 2.                  | Центрифуга                                  | 5   |
| 3.                  | Водяная баня                                | 5   |
| 4.                  | Фотоэлектроколориметр                       | 2   |
| 5.                  | Шкаф сушильный                              | 1   |
| 6.                  | Штативы для пробирок                        | 20  |
| 7.                  | Спектрофотометр PV 1251C                    | 1   |
| 8.                  | Весы торсионные                             | 1   |
| 9.                  | Микроскоп биологический                     | 1   |
| Лабораторная посуда |                                             |     |
| 1.                  | Пробирки                                    | 300 |
| 2.                  | Пробирки центрифужные с делением            | 100 |
| 3.                  | Колбы 250 мл                                | 15  |
| 4.                  | Колбы 500 мл                                | 15  |
| 5.                  | Пипетки                                     | 100 |
| 6.                  | Ступки                                      | 20  |
| 7.                  | Спиртовки                                   | 20  |
| 8.                  | Чашки Петри                                 | 320 |
| 9.                  | Склянки с притертыми пробками (125-1000 мл) | 80  |
| 10                  | Склянки 30 мл                               | 100 |

**12. Description of the material and technical base necessary for the implementation of the educational process in the discipline**

| №<br>п/п                 | Equipment identification                     | Quantity | Technical condition |
|--------------------------|----------------------------------------------|----------|---------------------|
| 1                        | 2                                            | 3        | 4                   |
| <b>Special equipment</b> |                                              |          |                     |
| 1.                       | Automatic biochemical analyzer CA-400 Furuno | 1        | Meet the            |

|    |                                                          |   |                                                                  |
|----|----------------------------------------------------------|---|------------------------------------------------------------------|
|    |                                                          |   | requirements of regulatory and technical documentation.          |
| 2. | Semi-automatic biochemistry analyzer «Clima» MC-15       | 1 | Meet the requirements of regulatory and technical documentation. |
| 1. | Automatic system «Alisei»                                | 1 | Meet the requirements of regulatory and technical documentation. |
| 2. | Hematology analyzer «Medonic»                            | 2 | Meet the requirements of regulatory and technical documentation. |
| 3. | Binocular microscope "Micron"                            |   | Meet the requirements of regulatory and technical documentation. |
| 4. | Medical four-channel blood clotting analyzer "KoaTest-4" | 1 | Meet the requirements of regulatory and technical documentation. |
| 5. | DIRUI H-100 urine analyzer                               | 1 | Meet the requirements of regulatory and technical documentation. |
| 6. | Urine test strip analyzer «UroMeter»                     | 1 | Meet the requirements of regulatory and technical documentation. |
| 7. | Analyzer of gases and electrolytes GEM Premier 3000      | 1 | Meet the requirements of regulatory and technical documentation. |
| 8. | Biochemistry test strip analyzer Nano Checker            | 1 | Meet the requirements of                                         |

|     |                                                  |   |                                                                  |
|-----|--------------------------------------------------|---|------------------------------------------------------------------|
|     |                                                  |   | regulatory and technical documentation.                          |
| 9.  | Stopwatch                                        | 1 | Meet the requirements of regulatory and technical documentation. |
| 10. | Dispenser automatic portable medical "Lenpipet", | 5 | Meet the requirements of regulatory and technical documentation. |
|     | <b>Auxiliary equipment</b>                       |   |                                                                  |
| 11. | Sterilizer                                       | 1 | Meet the requirements of regulatory and technical documentation. |
| 12. | Drying cabinet                                   | 1 | Meet the requirements of regulatory and technical documentation. |
| 13. | Centrifuge "Liston"                              | 2 | Meet the requirements of regulatory and technical documentation. |
| 14. | Conductometric shape counter                     | 1 | Meet the requirements of regulatory and technical documentation. |
| 15. | Goryaeva camera                                  | 4 | Meet the requirements of regulatory and technical documentation. |
| 16. | Fuchs-Rosenthal camera                           | 1 | Meet the requirements of regulatory and technical documentation. |
| 17. | Minshaker                                        | 1 | Meet the requirements of regulatory and technical documentation. |

|                         |               |   |                                                                  |
|-------------------------|---------------|---|------------------------------------------------------------------|
| 18.                     | Distiller     | 1 | Meet the requirements of regulatory and technical documentation. |
| 19.                     | Refrigerators | 4 | Meet the requirements of regulatory and technical documentation. |
| 20.                     | Thermostat    | 1 | Meet the requirements of regulatory and technical documentation. |
| <b>Office equipment</b> |               |   |                                                                  |
| 21.                     | Computer      | 4 | Meet the requirements of regulatory and technical documentation. |

### **13. Conducting educational activities using e-learning and distance learning technologies**

Conducting educational activities using e-learning and distance learning technologies

In the context of the introduction of restrictive measures (quarantine) associated with an unfavorable epidemiological situation, the threat of the spread of a new coronavirus infection and other force majeure events that do not allow full-time training, it is possible to study this discipline or part of it using e-learning and distance educational technologies. Teaching the discipline in the above situations will be carried out through the development of an electronic course with access to video lectures and interactive course materials: presentations, articles, additional materials, tests and various tasks. When conducting training sessions, monitoring progress, as well as intermediate certification of students, platforms of the electronic information and educational environment of the academy and / or other e-learning systems recommended for use in the academy, such as Moodle, Zoom, Webinar, etc., can be used. Lectures can be presented in the form of audio, video files, "live lectures", etc. Conducting seminars and practical classes is possible in on-line mode both in synchronous and asynchronous modes. Seminars can be held in the form of web conferences.