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MINISTRY OF SCIENCE AND HIGHER EDUCATION

OF THE RUSSIAN FEDERATION

Federal State Budgetary Educational Institution of Higher Education

"CHECHEN STATE UNIVERSITY

NAMED AFTER AKHMAT ABDULHAMIDOVICH KADYROV"

FACULTY OF BIOLOGY AND CHEMISTRY

Department of Cell Biology, Morphology and Microbiology

WORK PROGRAMS

practitioner of the main professional educational program of higher education

(bachelor's degree program)

Training area	Biology
Training area code	06.03.01
Profile (orientation)	Microbiology
Graduate qualification	Bachelor
Form of training	Full-time/part-time work

Grozny, 2022

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FACULTY OF BIOLOGY AND CHEMISTRY

Department of Cell Biology, Morphology and Microbiology

Work program

«INTRODUCTORY PRACTICE»

Training area Biology

***Code* 06.03.01**

Orientation (profile) Microbiology

Grozny, 2022

1. Goals and objectives of mastering introductory practice

Practice goals:

- consolidation of theoretical knowledge in the disciplines of the profile "Microbiology".

Practice objectives:

- practical application of the skills of working with scientific and methodological literature;

- mastering microbiological terms, concepts and definitions;

- get acquainted with modern microbiological research methods;

- acquisition of new knowledge on scientific problems of microbiology;

- use of Internet resources to work with information.

2. List of competencies formed by practice in the process of mastering the educational program

Competence group	Competence category	Code and name of competencies
General professional services	General professional skills	OPK-8. He is able to use methods of collecting, processing, systematizing and presenting field and laboratory information, apply skills in working with modern equipment, and analyze the results obtained

3. Competencies, indicators of their achievement and results of practical training

Company code	Name of the competence indicator	Practical training achievements and results

OPK-8	OPK-8.1 Knows the main types of expedition and laboratory equipment, the features of the chosen object of professional activity, the conditions of its maintenance and work with it, taking into account the requirements of bioethics OPK-8.2 is able to analyze and critically evaluate the development of scientific ideas, draw up a plan for solving the problem on the basis of available resources, select and modify methodological techniques OPK-8.3 has the skills of using modern equipment in field and laboratory conditions, the ability to correctly justify the tasks set in the context of modern equipment management. ability to use mathematical methods for evaluating hypotheses, processing experimental data, mathematical modeling of biological processes, and adequately assess the reliability and significance of the results obtained, present them to a wide audience, and conduct a discussion	*Know:* basic research methods. *Be able to:* apply modern experimental methods of working with biological objects in laboratory conditions; draw up a research plan using basic microbiological equipment. *Possess:* primary skills of working with modern equipment; basic methods of conducting scientific research

4. Scope of practice

Types of academic work	*Forms of training*	
	Full-time job	*Full-time and part-time work*
	3rd semester	*4th semester*
Total labor intensity: credits / hours	2/72	2/72
Contact work:	4	2
Individual and group consultations	4	2
Seminar-type classes	48	48
Intermediate certification: ***credit*** / credit with assessment / exam		
Independent work (SRS)	20	22

Number of weeks	1 week	1 week

Notes:

1. credit and credit with assessment in full-time and part-time education is conducted within the framework of seminar-type classes. Hours are not allocated in the curriculum.

5. Practical training content, structured by topic / section with an indication of the number of academic hours allocated to them and the types of training sessions

5.1 Distribution of hours by sections/topics and types of work

5.1.1 Full-time education

3rd semester

№ n/a	Section / Topic	Types of academic work (in hours)						
		Contact work						Independent work
		Lecture-type classes		Seminar-type classes				
		Lectures	*Other training sessions (cons)*	*Practical exercises*	*Seven bunks*	*Labor atorn - slave.*	*Other activities*	
1	Organizational stage		2	4				2
2	Introductory-training stage			10				8
3	Experimental stage			26				8
4	Final stage		2	8				2
	Total		4	48				20

5.1.2 Full-time and part-time education

4th semester

№ n/a	Section / Topic	Types of academic work (in hours)		
		Contact work		Independent work
		Lecture-type classes	Seminar-type classes	

		Lectures	*Other training sessions (cons)*	*Practical exercises*	*Seven bunks*	*Labor atorn - slave.*	*Other activities*	
1	Organizational stage		1	4				2
2	Introductory-training stage			10				10
3	Experimental stage			26				8
4	Final stage		1	8				2
	Total		2	48				22

5.2 Internship program, structured by topic / section

5.2.1 Content of practice sections

№ n/a	Name of the practice topic (section)	*Content of the practice section*
1	Organizational stage	Familiarization with the goals and objectives of the practice. Distribution of individual tasks
		Drawing up a practice calendar
2	Introductory course - training stage	Introduction to the main research areas of the Department
		Rules for working with a personal computer
		Introduction to the main electronic catalogues of the University library
		Rules for the design of the first chapter (literature review) WRC
		Familiarization with scientific and experimental literature on the topic of individual tasks. Review of specialized literature
3	Experimental stage	Introduction to the Department's laboratory and research equipment
		Selection of methods of physiological research on a given topic
		Initial introduction to the methods of experimental work on the research topic
		Rules for completing the second chapter (research methodology) of the final qualification work
4	Final stage	Preparation of introductory practice reports. Consultations

		Report Protection

5.2.2 Content of practical exercises

№ r/a	Section name	Lesson topic	Practical lesson content	Reporting documentation
1	Organizational stage	Organization of practice	Familiarization with the goals and objectives of the practice. Occupational health and safety briefing safety	Introductory part of the report, which includes brief theoretical notes. information about the goals and objectives of the practice
2	Introductory-training stage	Research activity of the Department	Familiarization with the main areas of scientific research of the department. Attaching students to academic supervisors and defining a topic researches	List of preferred research areas student's research
		Rules working with using a personal computer	Basic safety rules when working with a computer. Regulatory framework: the basic law on labor protection; instructions for working with electronic computers; on labor protection during the operation of electronic computing equipment (State industrial safety committee); safety requirements when working with screen devices (Ministry of Social Policy)	Session protocol
		Electronic catalogs	Electronic library resources include: 1.IPRBooks (http://www.iprbookshop.ru) 2. Student advisor	List of electronic devices library catalogues, developed by the student

			(http://www.studentlibrary.r u) 3. IVIS (http://ivis.ru) 4. EBS "Lan" (https://e.lanbook.com) 5. Polpred.com	
		Registration rules	Chapter 1. Literature review. Literature review – description of the experience of others	Literature review

		the first chapter of the WRC	researchers, analysis of existing data and approaches. The opinions and conclusions of scientists are indicated, and an analysis is made sources. Essay required for justifications and proofs novelties It is also used to characterize the results of ongoing research. available database for further research	
		Special literature	The student must work through the main monographs and dissertations (if possible), theses, view specialized logs. For each source, you must: create a bibliographic list a business card. If there are articles in journals on the subject under study, they are summarized with the following information:	Bibliographic list of literature on the topic individual tasks

			creating bibliographic cards	
3	The final stage of the experiment	Introduction to the laboratory- research projects m department equipment	The student should familiarize himself with the main devices, systems, and test materials that will be used in the course of training. In the future, it will be used to collect factual material on the topic. individual tasks	Upon completion of the internship, the student must: provide short description the device, test, and its purpose. If possible, attach a photo
		Selection of methods microbiological researches by a specific topic	Research methods are ways to achieve a goal in scientific work. The student needs to understand what the methods are based on, who uses them.	Session protocol
			the author, as well as carefully note them down	
		Registration rules second chapter WRC	Chapter 2. Research methodology. A method is a way of implementing a method. Research methodology – a set of techniques, methods of research, the order of their application	Research methodology on the topic of WRC

6. Fund of assessment funds for conducting practical certification of students

The procedure for evaluating knowledge, skills, and abilities based on familiarization practice includes accounting for success in all types of assessment tools. Assessment of the quality of training of students includes current and interim certification.

Current control is a test of the assimilation of educational (theoretical and practical) material in the course of practical training. Current monitoring is carried out in the form of a report on an individual task.

The forms of intermediate control are a report and a test, which are submitted at the end of the internship. The structure and form of the practice report, which

consists of a Diary and the Report itself, is drawn up in accordance with the necessary requirements.

The fund of assessment funds for conducting intermediate certification of students in practice is issued in the appendix to the internship work program.

6.1 Passport of the assessment fund for conducting current practice certification

No. p / p	Controlled sections (topics)	Name of the appraisal tool
1	Organizational stage	Individual calendar- thematic plan
2	Introductory-training stage	Introductory Practice Diary
3	Experimental stage	
4	Final stage	Practice Report

6.2 Standard control tasks or other materials necessary for assessing knowledge, skills, and /or experience **in the current monitoring process**

Individual introductory practice plan

An individual practice plan provides for the student to work on a specific topic. The student gets acquainted in advance with the topic of the upcoming work and the plan for its implementation. Depending on the task at hand, a bachelor's student works under the supervision of a research supervisor, or independently, dealing with a separate narrow research issue.

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Federal State Budgetary Educational Institution of Higher Education

Chechen State University Faculty of Biology and Chemistry

Atconfirmed at the department meeting "___ " _____ 20 __ city of

Head of the Department Full name, signature

INDIVIDUAL PRACTICE PLAN

STUDENT (LEVEL-BACHELOR'S, SPECIALIST'S, MASTER'S DEGREE)

(20 _ /20 _ academic year)

(Full name of the student) _____

Training area _____

(code, name)

Name of the training profile _____

Form of training - _____

Duration of training in accordance with the Federal State Educational Standard - _____

Year of study, semester _____

Internship period: from "_ _ _ "20 to "" 20

Department _____

Head of the Department _____

(position, academic degree, academic title. Full name)

Head of Practice _____

(position, academic degree, academic title. Full name)

Introductory Practice Diary

During the course of practical training, the student is required to keep a practice diary, which is part of the practice report and is used when writing it.

The diary should briefly reflect the types of work performed by the student in practice (collecting material, conducting research, etc.), as well as the difficulties encountered in the work, their nature, what measures were taken to eliminate them, and eliminate shortcomings in theoretical training.

At the end of the internship, the diary must be signed by the student and the head of the internship from the academy.

The diary is attached to the practice report.

Practice Report

At the end of the internship, the student-intern makes a written report and submits it to the head of the internship at the same time as the diary.

The practice report reflects the work done by each student in the areas given in the internship program, with a mandatory description of the theoretical and methodological approaches used to complete the work, as well as conclusions and recommendations. The report is drawn up in accordance with the requirements and submitted to the department in hard copy.

The student is allocated 2-3 days at the end of practice to complete the report.

6.3 Methodological materials defining procedures for assessing knowledge, skills, abilities and (or) work experience

Individual plan

The individual plan is a scheme of research undertaken by the student, it consists of a list of areas of work related to the internal logic within the framework of the planned research. The research schedule defines specific calendar dates for completing these tasks.

№ n/a	Planned forms of work	Number of hours	Calendar dates of the event planned work
1	Organization of practice		
2	Familiarization with safety regulations in the laboratory		
3	Literature review by topic		

	researches		
4	Mastering research methods		
5	Primary research results obtained		
6	Mathematical processing received data		
Student			
Head of Practice			

Criteria for evaluating competencies

- compliance of the obtained practice results with the individual plan of bachelor's research practice;

− the degree of mastery of scientific terminology;

− the degree of theoretical elaboration of the scientific topic;

- mastering new research methods and applying them in practical work;

− the level of elaboration of the obtained primary results (availability of a database, statistical mathematical processing of the results).

Competence assessment scale

Evaluation is carried out according to the "credited" / "not credited"system.

The *"credited"* rating corresponds to the completion of an individual practice task
Competence assessment scale

Evaluation is carried out according to the "credited" / "not credited"system

The "credited" score corresponds to the completion of an individual practice task.

Practice Diary

During the internship, the student keeps a diary, where he keeps daily records of the work done, certified by the supervisor or curator of the internship. In the diary, the head of the practice draws up a description of the student.

The practice diary contains the following information::

– information about the place and terms of the internship;

- calendar schedule of practical training;

- name of the departments where the internship took place;
  - topic and content of an individual task that corresponds to the approximate topic of the bachelor's final qualification work;
  - content of developed and studied practical questions, work performed on them;
  - list of materials collected by the student during the internship period;
  - comments and recommendations of the head of practice from the department;
  - characteristics of the supervisor based on the results of the internship, etc.

The diary is submitted together with the report on the practice, after its registration at the department, to the head of the practice from the department.

Criteria for evaluating competencies

- below the threshold (rating "unsatisfactory" ("not credited"))

- threshold (rating "satisfactory" ("credited"))

- standard (rating "good" ("credited"))

- reference (grade "excellent" ("credited"))

Rating scale

Evaluation of the practice diary is carried out according to the "credited" / "not credited"system.

"Credited" – the practice diary is completed in full, there may be some shortcomings in the design of the submitted material. The student showed a high level of independence and creativity in performing individual tasks.

"Not credited" – the diary is only partially filled in, there are numerous comments on the design of the collected material.

Practice Report

The student's practice report consists of a title page, an explanatory note, and an appendix.

The title page is the first page of the report and serves as a source of information about the authors, practice managers, place and time of writing the report. The Explanatory note contains:

- content;
- introduction;
- the main part;
- conclusion;
- list of sources used;

– applications.

The content is a sequential enumeration of sections (chapters), subsections (paragraphs). The content should include all the headings available in the work, including the list of sources used and appendices.

The introduction should contain information about the goals and objectives of the practice, the name of the organization, a brief history of its creation, the type of organization, the direction of activity, the organizational and legal form, and other information about the organization that students received during acquaintance with the organization. The recommended length of the introduction should be approximately 2-3 pages of typewritten text.

The main part of the report should contain text materials and numerical data that reveal the entire topic of the internship program and research areas. The recommended length of the main part should be 8-10 pages of typewritten text.

The conclusion should contain brief conclusions and recommendations based on the results of practical training and research work. The recommended size is 2-3 pages of typewritten text.

The report size is up to 15 pages of printed text, with standard fields.

The report is defended at the department. The report must be protected within the specified time frame. The report takes 10 minutes to complete. At the same time, a written report and an intern's diary are provided. After the report, the student is asked questions about his work.

During the defense process, the level of practice results is identified, and the completeness and correctness of answers to the questions asked are evaluated. Assessment of the practice results is recorded in the statement and credit book. The presentation of the material should be consistent and logical. All sections must be logically linked. You should pay special attention to logical transitions from one section to another, from paragraph to paragraph, and within a paragraph - from question to question. Conclusions and suggestions for the work should be clear, understandable and evidence-based, logically follow from the content of the sections of the work. Please provide a bibliographic list at the end of the report. It must contain at least 10 sources studied by the author and be designed in accordance with GOST (author, name of the source, place of publication, publisher, year of publication and number of pages of the text). The names of authors and titles of works (if the author is not specified) are placed strictly in alphabetical order. Different alphabets are not mixed in the same list. Foreign sources usually place them at the end of the list of all materials. All cited literary sources should be referenced in the paper with page numbers. It is recommended to include materials in appendices that cannot be included in the main part for any reason. The content of applications can be very diverse: copies of original documents, excerpts from reporting materials. They can take the form of text, tables, graphs, or maps.

The report is accompanied by a practice diary, which must be signed by the head of the practice.

Criteria for evaluating competencies

- level of practice results;
- consistency and consistency of the material presented;
- own point of view on the problem and the level of its argumentation;
- creating a report;
- completeness and correctness of the answers to the questions asked.

Rating scale

The report is evaluated using the "credited" / "not credited"system.

"Credited" is issued to the student if he / she has made a written registration of all sections of the practice, showing the degree of mastering theoretical and practical skills in document processing, demonstrating the formation of the necessary competencies.

"Not credited" is issued if the student did not make a written registration of all sections of the practice or submitted a report on the practice in the form of separate material, the results of their work were issued with violations of the requirements or did not cope with them independently, demonstrating the lack of formation of one or all the necessary competencies.

Guidelines for organizing and completing internships

Before starting the internship, the head of the internship conducts organizational meetings of students. The purpose of these meetings is to::

- announcement of the distribution of students by internship locations and internship dates;
- conducting a safety briefing;
- familiarization with the program, goals and objectives of the practice;
- recommendations for compiling practice reports.

Supervision of the internship is carried out by the head of the practice. At the end of the internship, they check the internship report, perform an individual task, and evaluate the work performed.

The practice report reflects the work done by each student in the areas given in the internship program, with a mandatory description of the theoretical and methodological approaches used to complete the work, as well as conclusions and recommendations. The report is drawn up in accordance with the requirements and submitted to the department in hard copy.

The report is defended at the department. The report must be protected within the specified time frame. The report takes 10 minutes to complete. At the same time,

a written report and an intern's diary are provided. After the report, the student is asked questions about his work.

Certification based on the results of practical training is carried out on the basis of a written report of the student drawn up in accordance with the established requirements. Based on the results of certification, a credit is issued. Assessment of the practice results is recorded in the statement and credit book.

7. List of basic and additional educational literature, periodicals required for mastering the discipline (module)

7.1 Basic literature

1. Zaitseva L. M. Organization of educational practice on obtaining primary skills: methodological guidelines / L. M. Zaitseva. - Kinel: RIO SGSHA, 2017. - 30 p.
2. Gnilomedova L. P. Metodicheskie napravleniya po prokhodeniyu praktik [Methodological guidelines for practical training]. - Kinel: RIO SGSHA, 2018. - 38 p.

7.2 Additional literature

1. Atramentova L. A. Design and statistics of biological research. - Publishing house "NTMT", 2014. - 255 p.
2. Berezina M. G., Prokhorova A.M. Metody funktsional'noi diagnostiki: metodicheskie rekomendatsii [Methods of functional diagnostics: methodological recommendations]. Kemerovo: INT LLC, 2012.
3. Solodkov A. S. Guide to practical exercises in human physiology [Electronic resource]: textbook / Solodkov A. S.— Electron. text data. Moscow: Sovetskiy sport Publ., 2011, 200 p. (in Russian).— Access mode: http://www.iprbookshop.ru/9898. — EBS "IPRbooks", by password

8. Modern professional databases and information reference systems

- Reference legal system "Consultant Plus" [Electronic resource]. - Access mode: http://www.consultant.ru
- Reference and legal system legislation of the Russian Federation "Earnt" [Electronic resource]. - Access mode: http://www.garant.ru
- Abstract and reference database of reviewed literature Scopus [Electronic resource]. - Access mode: https://www.scopus.com/
- Polythematic abstract-bibliographic and scientometric (bibliometric) database Web of Science [Electronic resource]. - Access mode: https://apps.webofknowledge.com;
- Database of the Scientific Electronic Library eLibrary.RU [Electronic resource]. - Access mode: http://www.elibrary.ru/

9. Software composition

a) information technology:

- problem-based learning technologies (problem discussions during the discussion of work results, conducted in the form of a dialogue, solving professional problems during consultations with specialists);

- game technologies (conducting trainings, business games, "intellectual warm-ups", "brainstorming sessions");
- interactive technologies (collective discussion of the results obtained);
- information and communication educational technologies (modeling of the studied phenomena);
- project-based learning technologies.

b) software:

- Microsoft Windows 7 Professional 6.1.7601 Service Pack 1;
- Microsoft Windows SL 8.1 RU AE OLP NL;
- Microsoft Office Standard 2010;
- Microsoft Office standard 2013; 1
- Kaspersky Endpoint Security for Business-standard Russian Edition.
- WinRAR:3.x: Standard License - educational -EXT;
- 7 zip (free access).

c) list of licensed software:

- Softex LLC by Kaspersky Endpoint Security Educational Renewal.
- JSC "Antiplagiat" PO " Antiplagiat. UNIVERSITY"
- MMIS Laboratory LLC Software "Automation of educational process management"
- LLC "Mintercom" PO "Rosmetod"

10. Equipment and technical means of training

Technical training tools

1. Audience equipped with presentation equipment (Epson video projector, stulus, remote control, screen, computer / laptop);
2. Set of electronic presentations/slides;
3. General-purpose application training software packages (text editors, image editors);
4. Electronic library of the course.

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FACULTY OF BIOLOGY AND CHEMISTRY

Department of Cell Biology, Morphology and Microbiology

Work program

«RESEARCH PRACTICE (OBTAINING PRIMARY SKILLS IN RESEARCH WORK)»

Training area Biology

***Code* 06.03.01**

Orientation (profile) Microbiology

Grozny, 2022

1. Goals and objectives of mastering research practice

Practice goals:

- initial adaptation to professional activity, including the formation of research skills.

Practice objectives:

- develop skills in working with special literature;

− introduce you to the electronic catalogues of the university library;

- teach you to organize the received information;

- gain experience in drawing up an information report on the sources of scientific information on the proposed topic;

- collection of literature material on the problem for WRC design;

− familiarization with the laboratory equipment of the department;

- mastering the main research methods on the topic of WRC;

− mastering the skills of writing results; − submission of a report on the results of the work performed; − protecting the submitted report.

2. List of competencies formed by the discipline in the process of mastering the educational program

Competence group	Competence category	Code and name of competencies
Universal	Development and implementation of projects	UK-2. It is able to determine the range of tasks within the set goal and choose the best ways to solve them, based on current legal norms, available resources, etc. restrictions
General professional services	General professional skills	OPK-8. He is able to use methods of collecting, processing, systematizing and presenting field and laboratory information, apply skills in working with modern equipment, and analyze the results obtained

Professional services	Research activities	PC-4. Ability to operate state-of-the-art hardware and equipment for performing scientific research- research laboratory work

3. Competencies, indicators of their achievement and results of practical training

Company code	Name of the competence indicator	Practical training achievements and results
UC-2	CC-2.1 Knows the main regulatory documents regulating the teaching of professional disciplines; regulatory legal documents; basic legislative acts, theoretical foundations of law. CC-2.2 is able to assess legal relationships and situations; draw up documents; use reference and information resources. legal knowledge systems and state automated systems; use regulatory legal documents to solve the following issues: professional tasks	*Know:* theoretical foundations of specialized disciplines; systematic nature of scientific knowledge. *Be able to:* acquire new knowledge using modern educational technologies; work with literary sources on the proposed topic; find the necessary information in scientific journals and the Internet; work with electronic catalogs of the university library; make an information report on the sources of scientific information on the proposed topic. *Own:*skills of reviewing scientific literature; skills of using modern information technologies to acquire new knowledge

OPK-8	OPK-8.1 Knows the main types of expedition and laboratory equipment, the features of the chosen object of professional activity, the conditions of its maintenance and work with it, taking into account the requirements of bioethics OPK-8.2 is able to analyze and critically evaluate the development of scientific ideas, draw up a plan for solving the problem on the basis of available resources, select and modify methodological techniques OPK-8.3 has the skills of using modern equipment in field and laboratory conditions, the ability to correctly justify the tasks set in the context of the current state of the problem, the ability to use mathematical methods for evaluating hypotheses, processing experimental data, mathematical modeling of biological processes and adequately assess the reliability and significance of the results obtained, present them to a wide audience and conduct a discussion	*Know:* basic research methods on the topic of the thesis. *Be able to:* apply modern experimental methods of working with biological objects in laboratory conditions; draw up a research plan using basic physiological equipment. *Possess:* primary skills of working with modern equipment; basic methods of conducting scientific research on the topic of WRC
PC-4	PC-4.2. Is able to: prepare material for laboratory analysis; perform laboratory biological studies using modern equipment. PC-4.3. Has: skills of working on modern office equipment, computers and computer networks; principles of operation of modern equipment and equipment; skills of conducting laboratory research; skills of maintaining documentation of laboratory observations; skills of preparing reagents	*Know*: requirements for writing and compiling reports and explanatory notes. *Be able to:* apply the acquired knowledge on the design and presentation of the results of training practice to prepare a report; report the results of their research work. *Possess:* modern computer technologies; basic techniques and methods of design and presentation practice results

4. Scope of practice

Types of academic work	*Forms of training*	
	Full-time job	*Full-time and part-time work*

	4th semester	*4th semester*
Total labor intensity: credits / hours	3/108	3/108
Contact work:	4	2
Individual and group consultations	4	2
Seminar-type classes	72	72
Intermediate certification: ***credit*** / credit with assessment / exam		
Independent work (SRS)	32	34
Number of weeks	2 weeks	2 weeks

Notes:

1. credit and credit with assessment in full-time and part-time education is conducted within the framework of seminar-type classes. Hours are not allocated in the curriculum.

5. Practical training content, structured by topic / section with an indication of the number of academic hours allocated to them and the types of training sessions

5.1 Distribution of hours by sections/topics and types of work

5.1.1 Full-time education

4th semester

№ n/a	Section / Topic	Types of academic work (in hours)						
		Contact work						Independen work
		Lecture-type classes		Seminar-type classes				
		Lectures	*Other training sessions (cons)*	*Practical exercises*	*Seven bunks*	*Labor atorn - slave.*	*Other activities*	
1	Preparatory stage		2	6				4
2	Main stage			30				16
3	Final stage		2	36				12
	Total		4	72				32

5.1.2 Full-time and part-time education

4th semester

№ n/a	Section / Topic	Types of academic work (in hours)						
		Contact work						Independent work
		Lecture-type classes		Seminar-type classes				
		Lectures	*Other training sessions (cons)*	*Practical exercises*	*Seven bunks*	*Labor atorn - slave.*	*Other activities*	
1	Preparatory stage		1	6				6
2	Main stage			30				16
3	Final stage		1	36				12
	Total		2	72				34

5.2 Internship program, structured by topic / section

5.2.1 Content of practice sections

№ n/a	Name of the practice topic (section)	*Content of the practice section*
1	Preparatory stage	Practice planning, defining the goals and objectives of the practice, scope, and test requirements. Safety briefing. Independent development of a research plan. Discussion of the research plan with the head of the practice
2	Main stage	Referencing the literature on the research topic, working out the main specialized journals, searching for sources in the collections of the scientific library and on the Internet. Conducting a research fragment on the research topic: performing a basic set of methods planned for research under the supervision of the practice manager; creating electronic databases in Excel and/or Statistica format (version 6.0 and higher); processing research results; preparation and execution of a practice report
3	Final stage	Students ' submission of written and electronic reports on the performance of individual tasks. Discussion of reports, comments on the implementation and suggestions for improving the scientific and technical-

		research practice. Certification of students

5.2.2 Content of practical exercises

№ r/a	Section name	Practical lesson content	Reporting documentation
1	Preparatory stage	Holding an organizational meeting. Familiarization with the regulatory documentation for the preparation and execution of final qualification works. Identification of practice goals and objectives. Drawing up an individual calendar plan together with the head of the practice.- thematic plan of the student's work in practice	Organizational meeting Individual calendar- thematic plan
2	Main stage	1. Determine the methods of organizing and conducting research work for writing a thesis; master the skills of creating scientific and methodological works, get acquainted with their types and forms of presentation. To identify the goals and objectives of scientific and methodological activities for writing the methodological section of the thesis; to give a general description of the methods necessary for the preparation of the thesis, to reveal the features of the research; to choose methods and means of solving research problems, to compile a bibliography on the subject of research; to master the methodology and methodology of research work; to analyze and summarize empirical material. 2. Prepare a report on the topic, as well as a report on the research topic. Systematize the received materials and prepare a study	Written practice report Practice Diary

		according to the approved individual task.	
3	Final stage	Filling out report forms. Approval of report forms with the supervisor and supervisor practice sessions. Report Protection	Practice Report

6. Fund of assessment funds for conducting practical certification of students

The procedure for evaluating knowledge, skills and abilities in research practice includes accounting for success in all types of assessment tools. Assessment of the quality of training of students includes current and interim certification.

Current control is a test of the assimilation of educational (theoretical and practical) material in the course of practical training. Current monitoring is carried out in the form of a report on an individual task.

The forms of intermediate control are a report and a test, which are submitted at the end of the internship. The structure and form of the practice report, which consists of a Diary and the Report itself, is drawn up in accordance with the necessary requirements.

The test is held at the end of practice. The student must answer 2 questions:

1. knowledge of theoretical questions;
2. possession of practical skills and abilities.

This makes it possible to assess the totality of universal, general professional and professional competencies that are fixed and newly acquired in the course of practical training by the student.

The fund of assessment funds for conducting intermediate certification of students in practice is issued in the appendix to the internship work program.

1. Passport of the assessment fund for conducting current practice certification

No. p / p	Controlled sections (topics)	Name of the appraisal tool
1	Preparatory stage	Control questions. On a calendar basis- thematic plan
2	Main stage	Practice Diary
3	Final stage	Research Practice Report

2. Standard control tasks or other materials necessary for assessing knowledge, skills, and /or experience **in the current monitoring process**

Control questions

Control questions are devoted to safety requirements when working in laboratory conditions, when working with biological materials, devices used in the collection of actual material, as well as characteristics of methods for organizing and performing research.

Research Practice Diary

During the entire period of research practice, the student makes daily entries in the diary, reflecting in detail the work done, in accordance with the individual task.

Entries in the internship diary should reflect not only the work performed, but also an independent analysis of its content and features, the student's attitude to controversial issues of practice, encountered difficulties in solving certain issues.

When filling out the diary, the intern should assume that the completeness and timeliness of the internship records will significantly facilitate the preparation of a written report.

Entries in the diary at least once a week are certified by the signature of the direct head of the practice.

The data obtained during the internship are the basis for preparing the final qualification work.

Research Practice Report

At the end of the internship, the student-intern makes a written report and submits it to the head of the internship at the same time as the diary.

The internship report should contain information about the specific work performed by the student during the internship period.

The student is allocated 2-3 days at the end of practice to complete the report.

Report content

1. An introduction that includes brief theoretical information about the goals and objectives of the practice.
2. Calendar and thematic work plan of the student.

2. A list of the student's preferred research areas.
3. A list of electronic library catalogues developed by the student.
4. Literature review and bibliographic list of references on the topic of an individual task.
5. Brief description of the device, test, and its purpose. If possible, attach a photo.
6. Methodology of research on the topic of final qualification work.
7. Conclusion.

Records of work performed during the internship

Date	Summary of the intern's work	Analysis of the work done
1	2	3

6.3 Methodological materials defining procedures for assessing knowledge, skills, abilities and (or) work experience

Control questions (*Standard questions)*

1. Basic safety rules.
2. Principles of scientific research organization, main stages of scientific research implementation.
3. Selection of the method and characteristics of research methods for performing research.
4. Safety rules for handling biological samples. Characteristics of the research object.
5. Characteristics of the main sources of information when compiling a literature review on the topic of the thesis.
6. Creating a database for entering primary research results.
7. Basic methods of mathematical analysis of research results.
8. Characteristics of the main types of illustrative materials for presenting and discussing research results.

Criteria for evaluating competencies (results)

– correct answer

Competence assessment scale

5 points – no errors in the response

4 points – mistakes were made in the answers, corrected with the help of leading questions

3 points – mistakes were made in half of the answers

2 points – mistakes were made in most of the answers

Filling out a diary

The practice diary contains the following information::

- information about the place and terms of the internship;
- internship schedule;
- name of the departments where the internship took place;
- topic and content of an individual task that corresponds to the approximate topic of the bachelor's final qualification work;
- content of developed and studied practical questions, work performed on them;
- list of materials collected by the student during the internship period;

– comments and recommendations of the head of practice from the department;

– characteristics of the supervisor based on the results of the internship, etc.

At the end of the internship, the diary is signed by the head of the practice. The diary is submitted together with the report on the practice, after its registration at the department, to the head of the practice from the department.

Criteria for evaluating competencies

- implementation of the practice program;

– student's attitude to work;

- characteristics of the supervisor based on the results of the internship.

Rating scale

Assessment is made on a 4-point scale ("excellent", "good", "satisfactory", "unsatisfactory").

Rating "5" excellent	Rating "4" is good	Rating" 3 " satisfactory
The diary is filled out accurately, in a timely manner, and correctly	The diary is filled out accurately, in a timely manner, and correctly	The diary is filled in sloppily, not properly. timely
Types of work are presented in accordance with the requirements of the internship program, are descriptive in nature, and are logically justified	The types of work are not fully represented, or in a professional language	Entries are short and do not meet the program's requirements

Research Practice Report

Creating a report

At the end of the internship, the student-intern makes a written report and submits it to the head of the internship at the same time as the diary.

The internship report should contain information about the specific work performed by the student during the internship period.

The student is allocated 2-3 days at the end of practice to complete the report.

Report content

1. An introduction that includes brief theoretical information about the goals and objectives of the practice.
2. Calendar and thematic work plan of the student.

2. A list of the student's preferred research areas.
3. A list of electronic library catalogues developed by the student.

4. Literature review and bibliographic list of references on the topic of an individual task.
5. Brief description of the device, test, and its purpose. If possible, attach a photo.
6. Methodology of research on the topic of an individual task.
7. Conclusion.

Records of work performed during the internship

Date	Summary of the intern's work	Analysis of the work done
1	2	3

Creating a report

The report should consist of 20-25 pages of typewritten standard text. The design of the report, as well as the diploma project, must comply with GOST 7.322001.

Report text pages, illustrations and tables included in the report must correspond to the A4 format in accordance with GOST 9327.

The report should be executed using a computer and printer on one side of a sheet of white A4 paper at one and a half intervals. The font color must be black, and the height of letters, numbers, and other characters must be at least 1.8 mm (size 12-14).

The report text should be printed using the following field sizes: right — 10 mm, top — 20 mm, left and bottom — 20 mm.

It is allowed to use computer capabilities to focus attention on certain terms, formulas, and theorems, using fonts of different typefaces.

Report submission and protection

The form of control is the protection of students ' reports on research practice.

The defense of the report on research practice is organized by the graduating department within five days after the end of the internship.

A commission is created to protect the student's report on research practice. The defense draws attention to the conclusions and content of the detailed conclusion made by the student.

The results of defending the report on research practice are evaluated and drawn up in a statement with a corresponding entry in the student's credit book.

A differentiated credit is issued after students have provided all the necessary reporting forms.

Criteria for evaluating competencies

The form of control is the protection of students ' reports on research practice.

The defense of the report on research practice is organized by the graduating department within five days after the end of the internship.

A commission is created to protect the student's report on research practice. The defense draws attention to the conclusions and content of the detailed conclusion made by the student.

The results of defending the report on research practice are evaluated and drawn up in a statement with a corresponding entry in the student's credit book.

A differentiated credit is issued after students have provided all the necessary reporting forms.

Rating scale

The report is evaluated using the "credited" / "not credited"system.

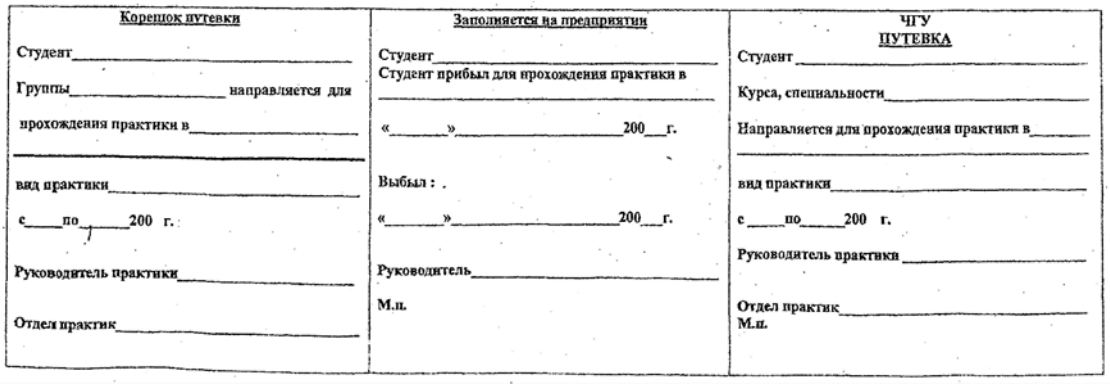
"Credited" is issued to the student if he / she has made a written registration of all sections of the practice, showing the degree of mastering theoretical and practical skills in document processing, demonstrating the formation of the necessary competencies.

"Not credited" is issued if the student did not make a written registration of all sections of the practice or submitted a report on the practice in the form of separate material, the results of their work were issued with violations of the requirements or did not cope with them independently, demonstrating the lack of formation of one or all the necessary competencies.

Methodological guidelines for students on mastering research practice

Guidelines for students

Filling out the internship permit form, collecting signatures



Корешок путевки	Заполняется на предприятии	ЧГУ ПУТЕВКА
Студент_____ Группы_____ направляется для прохождения практики в_____ _____ вид практики_____ с____по____200 г. Руководитель практики_____ Отдел практик_____	Студент_____ Студент прибыл для прохождения практики в _____ «_____»_____200___г. Выбыл : . «_____»_____200___г. Руководитель_____ М.п.	Студент _____ Курса, специальности_____ Направляется для прохождения практики в_____ _____ вид практики_____ с____по____200 г. Руководитель практики _____ Отдел практик_____ М.п.

The student's research practice is carried out according to an individual calendar plan drawn up by him together with the head of the practice from the Department of Cell Biology, Morphology and Microbiology of the Faculty of Biology and Chemistry of the Chechen State University. The plan should indicate the names of the stages and the number of working days for each of them.

Approximate calendar and thematic plan for conducting practical training

№ n/a	Content of the work	Lead Time	Number of days
1	2	3	4

The student also receives an internship program from the supervisor, an individual task, and instructions on how to complete the internship.

During the internship period, students are required to::

− perform tasks provided for in the internship program in good faith;

- comply with the applicable internal regulations;

- follow the safety regulations, handle the devices in accordance with the current instructions;

- maintain the required order in the laboratory and workplace.

Organization of independent work of students

Research practice involves independent work of the student and consists in performing an individual task.

The individual plan provides for the student's work on a specific topic. The student gets acquainted in advance with the topic of the upcoming work and the plan for its implementation. Depending on the task at hand, a bachelor's student works under the supervision of a research supervisor, or independently, dealing with a separate narrow research issue. The data obtained during the internship is the basis for preparing the course work.

Independent work of students consists in the following: keeping a diary of academic practice, where the content and results of work are recorded daily. The student's records are reviewed and approved by the practice supervisors at least once a week.

Guidelines for the head of practice

The general management of the research practice is carried out by the head of the practice from among the teachers of the department, appointed by the order of the university. The *head of research practice from the department is obliged to:* 1) help the student create an individual practice schedule and individual assignment;

2. carry out systematic monitoring and management of students ' practice, provide necessary explanations, demand timely and high-quality performance of work, and observe labor discipline.;

3. check the report compiled by the student (on the structure, content, conclusions, completion of an individual task and preparation of a practice report in accordance with the established requirements).
4. provide a general report on the results of practical training by students specializing in the Department of Human and Animal Physiology and Anatomy of the Faculty of Biology and Chemistry of the Chechen State University.

Sample report of the supervisor on the results of the research practice

MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION

FEDERAL STATE BUDGETARY EDUCATIONAL INSTITUTION

HIGHER EDUCATION INSTITUTION

CHECHEN STATE UNIVERSITY NAMED AFTER A. A. Kadyrov

report

group leader of the research practice

Faculty biologo-chemical department

Department Cell Biology, Morphology and Microbiology

Training area/profile 06.03.01 "biology" /microbiology

Form of training: _____

Type of practice: Practice for acquiring primary skills scientific research work

Methods of conducting an internship: Stationary _____

Terms of the internship _____ **Total number of students sent to practice** _____

Some of them successfully completed their internship_____

Completing goals and objectives practices: _____

_____

_____

_____

_____

_____

Formed competencies: YK-2; OPK-8; PK-4_____

_____ **Note**

_____

_____

_____

_____

Head of Practice _____

(signed) (Full name) **Head of the Department** _____

System for evaluating the quality of a research practice assignment

Evaluation of the results of a bachelor's research internship is differentiated. The requirement of differentiation means giving a rating based on a five-point system.

When summing up the results, you should follow the following five-point scale::

- excellent (5) full compliance with all requirements of the internship program;
- good (4) there are a number of minor shortcomings;
- satisfactory (3) there are significant comments and shortcomings, and a number of requirements are partially met;
- unsatisfactory (2) for most of the requirements, there are more significant

comments; the internship program was not completed.

An unsatisfactory grade means that the student must repeat the internship.

Characteristic

Characteristics of the student-intern and the conclusion of the head of the practice. (Implementation of the internship program and individual tasks, the student's attitude to work, participation in the social life of the team).

Head of Practice

Signature and seal

The description must contain the following information::

- level of theoretical training of the student
- ability to apply theoretical knowledge in practice
- intern's business and organizational skills
- attitude to work
- public activity and initiative

– discipline

– recommendations on the readiness of this intern for activities to professional

– recommended practice score

The characteristic must be certified by the signature of the head of the practice from the institution-base of practice and sealed.

7. List of basic and additional educational literature, periodicals required for mastering the discipline (module)

7.1 Basic literature

1. 1. Gayrabekov R. Kh., Gayrabekova R. Kh., Dudurkhanova L. A. Laboratory practice on general microbiology. Grozny, 2010.

2. Labinskaya A. S. Practical guide to microbiological research, Moscow: State Publishing House of Medical Literature, 1963.

3. Medical microbiology. Part one./Edited by A.M. Korolyuk and V. B. Sboychakov.- St. Petersburg, 2002. - 267 p.

4. General and sanitary microbiology with microbiological research techniques: Textbook/Edited by A. S. Labinskaya, L. P. Blinkova, and A. S. Eshchina, Moscow: Meditsina Publ., 2004, 576 p.

5. Workshop of laboratory works with illustrated situational tasks on microbiology, immunology and virology/Edited by A. A. Vorobyov and V. N. Tsarev, Moscow: Meditsinskoe informatsionnoe agencie, 2008, 320 p. (in Russian).

6. Guide to Medical microbiology. General and sanitary microbiology. Book 1 / Call. Authors/Ed. Labinskaya A. S., Volina E. G.-Moscow: BINOM Publishing House, 2008. - 1080s.

7.2 Additional literature

Donetskaya E. G.-A. Clinical microbiology: A guide for specialists in clinical laboratory diagnostics, Moscow: GEOTAR-Media, 2011, 480p.

2. Private medical microbiology with the technique of microbiological research: A textbook/Edited by A. S. Labinskaya, L. P. Blinkova, and N. S. Yeshina, Moscow: Meditsina Publishing House, 2005, 600 p.

8. Modern professional databases and information reference systems

- Electronic library system "IPRbooks" http://www.iprbookshop.ru/

- Website of the Russian Open Education Portal - http://www.openet.ru/ – http://biobsu.org/phha/index.htm Training site on physiology.

Online resources on microbiology

– http://www.iqlib.ru

Electronic library of educational and scientific publications.

– http://www.cir.ru

University Information System of Russia.

– http://www.diss.rsl.ru

Electronic library of dissertations of the Russian State Library. Includes full-text databases of dissertations.

9. Software composition

- use of slide presentations during practical classes;

- organization of interaction with students via e-mail (solving organizational issues consulting via e-mail).

List of licensed software

1. Softex LLC by Kaspersky Endpoint Security Educational Renewal.
2. JSC "Antiplagiat" PO " Antiplagiat. UNIVERSITY"
3. MMIS Laboratory LLC Software "Automation of educational process management"
4. LLC "Mintercom" PO "Rosmetod"

10. Equipment and technical means of training

Technical training tools

1. Audience equipped with presentation equipment (Epson video projector, stulus, remote control, screen, computer / laptop);
2. Set of electronic presentations/slides;
3. General-purpose application training software packages (text editors, image editors);
4. 4. Electronic library of the course.

Devices and equipment for educational purposes

Laboratories of the department on the basis of the Faculty of Biology and Chemistry and the center for collective use of scientific and testing equipment, which have the following equipment::

1. Steam sterilizer BES-15L-LED-Nautomat

2. Drying cabinet SHS -40 (40l. 180C)

3. S series Medical Shaker:S -3. 02LA20

4. UV air recycling irradiator

5. Medical laboratory centrifuge

6. Micromed S-11 biological microscope with accessories

7. Scales Mass-1

8. Aquadistilator electric

9. Stand for test tubes SHPU Kron

10. Senco water bath, W-2-1003 p

11. Electric stove Irit IR-8201 1-komforochnaya with a thermostat

12. Measuring equipment

13. Savochek laboratory

14. Porcelain cups of different volumes

15. Small plastic petri dishes

16. Large plastic Petri dishes

MINISTRY OF SCIENCE AND HIGHER EDUCATION

OF THE RUSSIAN FEDERATION

Federal State Budgetary Educational Institution of Higher Education

"CHECHEN STATE UNIVERSITY

NAMED AFTER AKHMAT ABDULHAMIDOVICH KADYROV"

FACULTY OF BIOLOGY AND CHEMISTRY

Department of Cell Biology, Morphology and Microbiology

Work program

«PRACTICE IN THE FIELD OF PROFESSIONAL ACTIVITY»

Training area Biology

***Code* 06.03.01**

***Orientation (profile)* Microbiology**

Grozny, 2022

1. Goals and objectives of mastering practical training in the professional activity profile

Practice goal: training of highly qualified specialists to work in microbiological laboratories of medical institutions and industrial enterprises.

Practice objectives:

- develop practical skills necessary for performing bacteriological studies (identify pathogenic microorganisms in the preparation, sow the test material on nutrient media, isolate a pure culture with subsequent identification of the species).

- master methodical and practical material.

- perform a certain amount of laboratory work.

- issue a progress report.

- answer the teacher's questions in the test session.

in in the course of practice, students should learn:

- make a research plan.

- observe workplace safety practices, ensure infectious safety of staff and patients, and know the structure of the microbiological laboratory.

- possess research methods.

- set up an experiment as the main mechanism of cognition.

- conduct analytical research designed to provide the deepest possible insight into the nature of phenomena.

- formulate general patterns that follow from the results of the conducted research.

2. List of competencies formed by the discipline in the process of mastering the educational program

The process of passing an industrial internship is aimed at forming elements of the following competencies in accordance with the Federal State Educational Standard for Higher Education in this area of training:

CC-2.5; PC-1.1; PC-1.2; PC-1.3; PC-2.3; PC-2.4

a) Universal competencies (CC):

- Has the skills of working on documentation, publicly presents the results of solving a specific project task or the project as a whole (CC-2.5)

b) professional competencies (PC):

- Knows the device and principles of operation and control of the equipment used; safety rules when working on the equipment used; possible areas of use of equipment and equipment for performing biological research; basic principles of preparation and conduct of scientific research field and laboratory biological work (PC-1.1);

- Is able to use knowledge about the vital activity of microorganisms in professional activities (PC-1.2);

- Has the skills to work on modern equipment and equipment for performing scientific research field and laboratory biological work (PC-1.3);

- Provides sanitary and hygienic requirements when performing microbiological work; technical support of microbiological work: preparation of laboratory utensils and tools, preparation of reagents and nutrient media for growing microorganisms (PC-2.3)

- Is able to participate in the work on microbiological control of food safety and the environment of organisms (PC-2.4).

3. Information on the practice of obtaining professional skills and professional experience

4. CONTENT OF THE PRODUCTION PRACTICE

Data	Number of hours by type of training
	OFO, OZFO
Semester number	7, 9
Dates of the event	01.09.2021-18.09.2021
Location of the event	Laboratory block on the basis of the Department and the Center for Collective Use of the Chechen State University, Federal State Budgetary Institution, "Center of Hygiene and Epidemiology of the Chechen Republic"
Volume in hours	144ч.
Types of control	test

The total labor intensity of the practice is 144 hours, 4 credits,

98 hours on the ave., 46 hours on the s/r

4.1. Practical training topics

№	Practical lesson topic	Department Watch OFO OZFO
1. 1.	Familiarization with safety techniques.	5 3
2.	Methods of sterilization.	5
3.	Differential coloring of m /o by the Gram method. Morphology of the bacterium.	10
4.	Morphological features of micromycetes.	5
5.	Cultivation of m/o.	5
6.	Quantitative m/o accounting.	5
7.	Introduction to m / o soil.	10
8.	Analysis of air microflora, quantitative accounting of bacteria in water. Determination of the titer and index of Escherichia coli in water.	15
9.	Continuation of the previous topic	10
10.	Gram-based coloring method.	10

11.	Cooking and sterilizing dishes. found in the literature, if any.	10
12.	Preparation of media. Stages of preparation of media.	5
total:		98

4.2 Self-study topics

№	Self-study topic	Watch
1.	Master microscopy techniques: dark-field, phase-contrast, luminescent, electronic	5
2.	Master the method of preparing fixed preparations	2
3.	Master the method of preparation of native preparations: "hanging drop", "crushed drop"	4
4.	Master the method of determining the size of prokaryotic cells	2
5.	Master sophisticated bacterial staining techniques: according to Gram, Burri-Gins, Ozheshka and Zil-Nielsen, Neisser, Romanovsky-Giemsa, Omelyansky	6
6.	Learn how to prepare nutrient media, sterilize nutrient media and dishes	10
7.	Learn how to isolate a pure culture, study its biochemical properties, and then identify the species.	10
8.	Master methods of quantitative accounting of microorganisms	5
		46

5. Practical training content, structured by topic / section with an indication of the number of academic hours allocated to them and the types of training sessions

5.1 Content of the experimental part of the production practice

1. Preparation of fixed preparations from pure cultures of microorganisms.

2. Staining the drug with a simple method.

3. Determination of the shape and location of microbes in the prepared preparation.

4. Gram staining and microscopy of the preparation.

5. Determination of the presence of capsules in Klebsiella by the Burry-Gins method.

6. Detection of the presence of spores in a preparation from a spore culture of microorganisms by the Ozheshka and Zil-Nielsen method.

7. Study of the method of isolation of pure aerobic cultures.

8. Study of the method of isolation of pure anaerobic cultures.

9. Selection of nutrient media for various purposes: general, universal, differential diagnostic, electively selective, special.

10. Taking into account the growth pattern of anaerobic bacteria in liquid nutrient media (milk according to Tukaev, Kitt-Tarozzi) and in the Wilson-Blair medium.

11. Disinfection of the table surface and hands after working with microorganisms.

12. Decontamination of waste infected material and microbe-contaminated environmental objects.

13. Accounting for the results of changes in the "motley series" environments.5.2 Internship program, structured by topic / section

Practice in the professional activity profile includes two stages: the preparatory stage and the implementation of a practical task.

At the first (preparatory) stage, the student gets acquainted with the medical institution and its structure, as well as with practical tasks that he will need to solve during the internship. The student must clearly learn the list of their job responsibilities.

The second stage is the execution of work in accordance with the tasks set. At this stage, special attention should be paid to acquiring professional skills and skills in material processing and reporting. All these skills will be useful for writing a practice report and, of course, in further practical activities.

2. Content of practice sections

№ r/a	Section name and address	Content of the practice section	Reporting documentation
1	Prepare the final stage	Determination of the general direction of the experiment and distribution of topics among students	Calendar and thematic plan
		Preliminary introduction to the main literature on the research topic	
		Drawing up a general research plan	
2		Selection and familiarization with research methods	Protocol

	Experimental stage	Mastering the methods of experimental work. Introduction to the experimental technique	Protocol
		Bookmark an experiment. Preparation of study objects and dishes. Study of laboratory equipment	Protocol
		Calculations and preparation of reagents for research	Protocol
		Conducting the first preparatory phase of the experiment	Protocol
		Mastering the methodology of primary statistical processing of experimental results	Results of statistical processing
3	Effective but- analytical stage	Analysis of the results obtained. All the actual (digital material) obtained in the experiment must be reliable, obvious, without assumptions.	Report on received data using visual data
		Discussion of the obtained data in comparison with those previously found in the literature, if any.	Report
		Writing practice reports. Consultations	Report
		Protect reports based on experiment results.	Protection of research papers and reports

3.3. Content of the experimental part of the production practice

1. Preparation of fixed preparations from pure cultures of microorganisms.

2. Staining the drug with a simple method.

3. Determination of the shape and location of microbes in the prepared preparation.

4. Gram staining and microscopy of the preparation.

5. Determination of the presence of capsules in Klebsiella by the Burry-Gins method.

6. Detection of the presence of spores in a preparation from a spore culture of microorganisms by the Ozheshka and Zil-Nielsen method.

7. Study of the method of isolation of pure aerobic cultures.

8. Study of the method of isolation of pure anaerobic cultures.

9. Selection of nutrient media for various purposes: general, universal, differential diagnostic, electively selective, special.

10. Taking into account the growth pattern of anaerobic bacteria in liquid nutrient media (milk according to Tukaev, Kitt-Tarozzi) and in the Wilson-Blair medium.

11. Disinfection of the table surface and hands after working with microorganisms.

12. Decontamination of waste infected material and microbe-contaminated environmental objects.

13. Accounting for the results of changes in the "motley series" environments.

6. Fund of assessment funds for conducting practical certification of students

The procedure for evaluating knowledge, skills, and practice skills by professional activity profile includes accounting for success in all types of assessment tools. Assessment of the quality of training of students includes current and interim certification.

Current control is a test of the assimilation of educational (theoretical and practical) material in the course of practical training. Current monitoring is carried out in the form of a report on an individual task.

The forms of intermediate control are a report and a differentiated credit, which are submitted at the end of the internship in the professional activity profile. The structure and form of the practice report, which consists of a Diary and the Report itself, is drawn up in accordance with the necessary requirements.

Differentiated credit is awarded at the end of practice. The student must answer 2 questions:

1. knowledge of theoretical questions;
2. possession of practical skills and abilities.

This makes it possible to assess the totality of universal and professional competencies that are fixed and newly acquired during the internship by the student.

When passing the test, the student's performance of individual tasks is also taken into account.:

creating a database of research results, materials for statistical processing and analysis of research results (in the form of tables, figures, diagrams, descriptions, conclusions or other materials), an abstract based on the results of studying experimental literature on the student's research topic.

1. Passport of the assessment fund for conducting current practice certification

No. p / p	Controlled sections (topics)	Name of the appraisal tool
1	Preparatory stage	Individual calendar-

		thematic plan
2	Experimental stage	Practice Diary
3	Performance-analytical stage	Practice Report

2. Standard control tasks or other materials necessary for assessing knowledge, skills, and /or experience **in the current monitoring process**

Individual internship plan for the professional activity profile

The individual practice plan includes several points. It contains answers to questions about what the student is going to do during the internship, what is his goal and main tasks, planned results, and the name of the future final qualification work of the student can be written in the plan.

The individual internship plan according to GOST 2021 standards must contain the name of the institution, department and faculty, as well as the address and duration of the internship. The individual plan may also contain information about the type of practice and the topic of the future final qualification work of the intern.

This individual plan is coordinated with the head of practice from the organization and approved by the head of practice from the educational institution.

Report

The word "abstract" comes from the Latin word "referre", which translates as"report, report".

Abstract is one of the forms of reporting on the results of industrial practice, it allows you to structure the acquired knowledge and practical skills.

The purpose of the abstract is to demonstrate the student's acquired knowledge and practical skills of research work, which can be used when writing a final qualification work (WRC).

Practice diary for the professional activity profile

The internship diary is one of the most important documents that is filled in during the entire internship process.

The form of the practice diary is issued to the student at the department. This document should include several sections, such as a title page, a practice calendar with a summary of the work performed.

The purpose of the internship diary is to record the information received and the materials that the student will need in the future to write the final qualification work.

Practice report on the professional activity profile

At the end of the internship, the intern student draws up a written report and submits it to the head of the internship at the same time as the diary signed by the direct head of the internship from the enterprise, institution, organization.

The internship report should contain information about the specific work performed by the student during the internship period.

The student is allocated 2-3 days at the end of practice to complete the report.

All collected practice materials should be analytically and statistically processed.

Evaluation stage	Evaluation result	Evaluation
1	Internship Diary	
2	Report on the results of the internship	
3	Characteristic	
4	Report	
5	Practice report	
6	Final assessment based on the results of the internship	

6.3 Methodological materials defining procedures for assessing knowledge, skills, abilities and (or) work experience

Individual plan

The individual practice plan is a scheme of research undertaken by the student, it consists of a list of areas of work related to the internal logic within the framework of the planned research. It includes a research calendar plan that defines specific calendar dates for completing these works. The practice calendar is one of the main elements of the practice report in accordance with GOST 2020 standards.

The individual practice plan according to GOST 2020 is drawn up in the form of a table and must include information about the planned work, the timing of these events,the place of practical tasks and classes. In the practice calendar, a note must be made about the completion/non-completion of an event. An individual internship plan allows you to see what activities are planned for the intern, whether they are performed exactly on time, and how well these activities correspond to the topic of the student's future final qualification work.

Criteria for evaluating competencies

- compliance of the obtained practice results with the individual bachelor's plan;

− the degree of mastery of scientific terminology;

− the degree of theoretical elaboration of the scientific topic;

- mastering new research methods and applying them in practical work;

− the level of elaboration of the obtained primary results (availability of a database, statistical mathematical processing of the results).

Competence assessment scale

The individual task is evaluated using the "credited" / "not credited"system.

The "credited" score corresponds to the completion of an individual practice task.

Report

The topic of the abstract corresponds to an individual task that the student must complete during the internship.

The abstract should contain the following sections::

- title page;

– table of contents or content;

– introduction;

– main part;

– conclusion;

– list of references; – applications.

Each section of the abstract should start with a new page.

The title page is made on A4 sheets in accordance with GOST 2.301. The title page is drawn up by the student in the form approved by the university. Deviations from the suggested form are not allowed. Columns of the title page are filled in by the student.

The table of contents or contents includes the introduction, the names of all sections, subsections, paragraphs and sub-paragraphs (if they have a name), the conclusion, the list of sources used, and the names of appendices, indicating the page numbers from which these elements begin.

The introduction should justify the choice of topic, provide the source data of the reviewed text, reveal the problems of the chosen topic, and reflect the goals and objectives of the practice. The volume of introduction for the abstract should be 1.5-2.0 pages.

The main part of the abstract contains data reflecting the essence, methodology, and main results of the work performed. The main part of the internship report should contain a description of the individual task for the duration of the internship. Volume: 12-15 pages. The main part of the text should be divided into sections(chapters), subsections, and paragraphs. Items can be divided into sub-items if necessary. When dividing the text of a document into paragraphs and sub-paragraphs, each paragraph must contain complete information. *In the conclusion of the abstract*, a general conclusion is made on the task applied for practice. The conclusion should be 1-3 pages long.

The list of references used in writing an abstract should be from 4 to 10 sources. The list of references may include: legislative and regulatory acts, special literature and periodicals, and Internet sources. Information about sources is provided in accordance with the requirements of GOST 7.1-2003, GOST 7.12-93 and GOST 7.82-2001.

It is recommended to include illustrative and auxiliary materials in appendices.

Building the abstract text

Documents are processed using a computer and printer. The volume of the entire abstract should be at least 15-20 typewritten sheets.

The text of the practice abstract is drawn up on white A4 paper (210 x 297 mm) on one side of the sheet, the line spacing is 1.5. The font color should be black (typeface or Times New Roman font), size (font size) - 14.

At least the size of the margins: right – 15 mm, left – 30 mm, top – 20 mm, bottom – 20 mm. Paragraph format: full alignment (in width). Paragraphs in the text start with an indent of 1.25 mm. The distance between the section and subsection headings, as well as the title and text, is one empty line.

Each section (chapter) starts on a new page. Headings of sections (chapters) should be made out in capital letters, use the Arial font size 16, without discharge, without underscores, without a dot at the end. Headings of sections (chapters) should be placed in the center of the sheet. Hyphenation in words is not allowed, as well as the separation of a preposition or conjunction from a related word.

Headings of subsections, paragraphs, and sub-paragraphs should be written with a paragraph indent with a capital letter without a dot at the end, and use the Arial font size 14. Headings should not be underlined.

Page numbering

Pages should be numbered in Arabic numerals, observing end-to-end numbering throughout the text (the title page is included in the general numbering, but the number is not indicated on it). Page numbers are placed in the center of the lower part of the sheet without a dot. Pages with figures and tables located on separate sheets should be included in the general numbering.

The text of the abstract should be concise, accurate, convincing wording and lack of secondary information.

Write proper names (surnames, names of organizations, etc.) in the original source language.

Submit for review the abstract together with the practice diary to the head of the production practice of the course from the clinical department.

Abstract is a scientific work, because it contains elements of scientific research.

Criteria for evaluating competencies (results)

1	Clarity of construction
2	Logical consistency and literacy
3	Persuasiveness of the argument
4	Brevity and clarity of wording, excluding the possibility of subjective and ambiguous interpretation
5	Evidence-based conclusions and recommendations

Competence assessment scale

Evaluation of the abstract is carried out according to the "credited" / "not credited"system.

"Credited" is issued if the abstract is designed in accordance with the requirements of the methodological guidelines (section "Requirements for the design of abstracts"), the topic is sufficiently developed, the material is well structured, and the number of references used is at least 4-10 sources.

"Not credited." If any of the criteria are not met, the abstract is returned for revision

Internship Diary

1. The diary is filled in daily, with a separate page assigned for each day.
2. A note must be made about the safety briefing that was conducted.
3. The work completion list reflects the number of work types completed by the student on a daily basis, according to the schedule, which contains a list of types of work and the number of days/hours of practice.
4. Every day, in the column "Content and scope of work done", the student's practical work on this day of practice is recorded.

Entries should contain professional terms and be structured.

The student's diary should reflect and clearly highlight:

– what did you do on your own;

– what I saw and observed;

– what kind of experimental work the student did.

The practice diary is supervised directly by supervisors and evaluated. When giving grades on a five-point system, the column "Assessment and signature of the direct supervisor" takes into account the quantity and quality of work performed, the correctness and completeness of the description of types of work, observations, etc.knowledge of the material set out in the diary, clarity, accuracy and timeliness of the entries made.

Criteria for evaluating competencies

1	Compliance of the diary structure with the requirements / availability of all sections
2	Availability of a practice plan that allows you to clearly define the type of student activity, the time spent on each type of task
3	Compliance of records with the requirements, according to which it is possible to clearly distinguish what the student saw and observed, what they conducted independently
4	Literacy of presentation and quality of work design
5	Timely registration and delivery of the diary

Rating scale

Assessment is made on a 4-point scale ("excellent", "good", "satisfactory", "unsatisfactory").

"Excellent"	− correspondence of the diary content to the internship program – the diary corresponds to the internship program; − structure (clarity of presentation of the material, compliance with the internship schedule); − all components of the diary are filled in in full; − the deadline for submitting your diary has not been violated
"Good"	− correspondence of the diary content to the internship program – the diary corresponds to the internship program; − not everywhere you can trace the structure (clarity of presentation of the material, there are discrepancies with the schedule of practical training); − all components of the diary are filled in in full; − the deadline for submitting your diary has not been violated

"Satisfactory"	− correspondence of the diary content to the internship program – the diary corresponds to the internship program; − not everywhere you can trace the structure (clarity of presentation of the material, there are discrepancies with the schedule of practical training); − the components of the diary are not fully filled in; − in the design of the diary, carelessness can be traced; − the deadline for submitting your diary has been violated
"Not satisfactory"	− correspondence of the diary content to the internship program – the diary does not correspond to the internship program; − broken structure, logic of the diary (does not correspond to the schedule of practical training); − the components of the diary are not filled in; − in the design of the diary, carelessness can be traced; − the deadline for submitting your diary has been violated

Practice Report

At the end of the internship, the student draws up a report on the results of the internship, which consists of two sections: a) digital and b) text.

The digital report includes the number of types of work performed during the entire internship period provided for in the internship program.

In the text report, the student notes the positive and negative aspects of the practice, as well as new knowledge and skills acquired during the practice. The report highlights (highlights) general competencies

Report content

1. After the introduction, which includes brief theoretical information necessary to complete the tasks, the experimental task is formulated and its purpose is determined.
2. The method of preparation of preparations, the devices used, the course of the experiment are described in detail, installation diagrams and drawings of the most complex devices are given.
3. The expected results are presented, attention is drawn to the key points of the experience.
4. Recommendations for analyzing the obtained data are given.
5. Completed tasks are recorded by students in the form of test reports with appropriate illustrative materials (drawings, diagrams, tables, etc.).
6. Attention is focused on the analysis and discussion of the results obtained.
7. Conclusions based on the results of the study.
8. The student has the right and opportunity to cover a number of issues in more detail, leaving some of them outside the scope of the presentation, or giving them more concisely.

Creating a report

The report should consist of 20-25 pages of typewritten standard text. The design of the report, as well as the diploma project, must comply with GOST 7.322001.

Report text pages, illustrations and tables included in the report must correspond to the A4 format in accordance with GOST 9327.

The report should be executed using a computer and printer on one side of a sheet of white A4 paper at one and a half intervals. The font color must be black, and the height of letters, numbers, and other characters must be at least 1.8 mm (size 12-14).

The report text should be printed using the following field sizes: right — 10 mm, top — 20 mm, left and bottom — 20 mm.

It is allowed to use computer capabilities to focus attention on certain terms, formulas, and theorems, using fonts of different typefaces. *Report submission and protection*

The form of control is students ' defense of practice reports.

Defense of the internship report is organized by the graduating department within five days after the end of the internship.

To protect the student's report on practice, a commission is created. The defense draws attention to the conclusions and content of the detailed conclusion made by the student.

The results of defending the practice report are evaluated and made out in a statement with a corresponding entry in the student's credit book.

A differentiated credit is issued after students have provided all the necessary reporting forms.

Criteria for evaluating competencies

- completeness of implementation of the internship program (evaluated on the basis of submitted materials);

- implementation of individual practice plans for all positions (evaluated based on the materials presented in the report);

- compliance with the requirements for the form and content of materials on the internship (reflecting in it all types of work provided for in the internship program and plan, the availability of supporting documents and materials on the performance of these works).

Rating scale

Assessment is made on a 4-point scale ("excellent", "good", "satisfactory", "unsatisfactory").

"Excellent": issued to a student who has completed the entire amount of work provided for in the internship program and individual task; systematically kept a diary in which he recorded the amount of work performed for each day of practice; provided a timely report on the completion of the internship in the professional activity profile, as well as a diary of the student-intern and a review-characteristic of the head of in accordance with the requirements of the internship program; the content of the sections of the internship report on the professional activity profile exactly corresponds to the required structure report, has a clear structure, logical sequence of presentation of the material, evidence-based conclusions and validity of recommendations; in the report, demonstrates excellent knowledge and skills provided by the internship program in the professional activity profile, presents the material in a reasoned and logical sequence, uses precise short formulations.

"Good": issued to a student who has completed the entire amount of work provided for in the internship program and individual assignment; kept a diary in which he recorded the amount of work performed in the internship; provided a report on the internship in the professional activity profile, as well as a diary of a student-intern and a review-characteristic of the internship manager, issued in accordance with the requirements of the internship program; content of sections the practice report on the professional activity profile basically corresponds to the required report structure, but has some deviations the report demonstrates a solid knowledge of the program material, competently and substantially presents it, does not allow significant inaccuracies in the answers, correctly applies theoretical provisions in the analysis of practical situations.

"Satisfactory": issued to a student who has completed the entire amount of work provided for in the internship program and individual task; periodically kept a diary in which he recorded the amount of work performed by the internship; provided a report on the internship in the professional activity profile, as well as a diary of an intern student and a review-characteristic of the internship manager from the enterprise, issued in accordance with with the requirements of the internship program; the content of the sections of the internship report on the professional activity profile mainly corresponds to the required structure However, the logical sequence of presentation of the material is broken, conclusions and recommendations are incorrect; the report demonstrates satisfactory knowledge and skills provided for in the production practice program.

"Unsatisfactory": issued to a student who has completed the entire amount of work provided for in the internship program and individual assignment; periodically kept a diary in which he recorded the amount of completed internship work; the content of the sections of the internship report on the professional activity profile basically corresponds to the required report structure, but the logical sequence of presentation of the material is violated, conclusions and recommendations are incorrect; has knowledge and skills provided by the internship program in the

professional activity profile, with great difficulties formulates answers to your questions;

Students who do not complete the internship program for a valid reason are sent to practice a second time in their free time or are interned individually.

Guidelines for students on mastering the internship program

Scientific supervisors at the department's meeting analyze students 'work in practice (the timeliness of students' arrival to practice, the completeness and quality of individual tasks), the feasibility of further use of practice databases, and make suggestions for improving practice.

Before practice, the student gets acquainted with the disciplines related to the focus of practice in the initial specialization. Relevant literature is provided in the programs of the disciplines. General management of practices is carried out by the head of the department. Each student is assigned to a supervisor who is appointed by the department. Head of practice - a teacher of the department who is the scientific supervisor of the final qualification work, curator of practice – an employee of the department who conducts research on a scientific problem or an employee of the institution on the basis of which the student is practicing. Curators assist the student in mastering the techniques.

For each student-intern, the supervisor draws up an individual work plan in accordance with the topic of the final qualification work, which is entered in the practice diary, and the terms of practice are also indicated there.

The head and curator of the internship should familiarize the student with the rules of occupational health and safety. If the internship is held in another institution, the internship plan is discussed with the supervisor from the organization that acts as the practice base. The supervisor makes estimates for material support, travel expenses, and draft orders for practical training (in accordance with the requirements of the Department of Practical Training of the Chechen State University). The general order on passing students of the Microbiology profile is drawn up by the head of the department on the basis of materials submitted by scientific supervisors.

During the internship, the student keeps a diary, where he keeps daily records of the work done, certified by the supervisor or curator of the internship. In the diary, the head of the practice draws up a description of the student.

At the end of the internship, the student draws up a report on the practice, which is defended at a meeting of the department. Based on the results of the report, an assessment is made and a conclusion is made about the possibility of writing a final work. At all stages of the internship, the student's supervisor provides consulting assistance and corrects the student's work.

Work with literature, collection of factual material is carried out by the student independently, but under the constant supervision of the supervisor and curator. When

working independently, the student should pay attention to the justification of the purpose and objectives of the practice, study methods and equipment, and it is recommended to take an active part in all stages of conducting experimental and theoretical work for writing the final qualification work. During the internship, research works are carried out, methods of studying physiological material are mastered, primary processing and interpretation of the obtained data is carried out, and literature sources on the research topic are analyzed. At the same time, a different arsenal of equipment, computer equipment and software is used.

Working with special literature

The student should study the main monographs, dissertations (if possible), theses, view specialized journals. A bibliographic card and abstract should be compiled for each source. If there are articles on the subject under study in journals, they are summarized with the compilation of bibliographic cards. The student needs to analyze the intensity of publications on this topic in journals. At the end of the internship, the student must submit to the supervisor a card file, essays and summaries of literary sources. At the end of the internship, the student must provide a literature review on the subject being studied. *Collecting factual material*

The student must prepare a description of the object and conditions of research. When mastering the techniques, you need to understand what they are based on, who their author is, and also carefully take notes on them. Data from observations and experiments must be entered in the work logs. On the cover of the journal, the subject, performer, and terms of research are indicated. Make sure to create a list of symbols that are used in records. Records should be kept clearly, accurately, with dates and units of measurement indicated. Working journals are reviewed and certified by scientific supervisors.

Analysis and processing of the material

All the obtained factual material should be analyzed using modern methods used for the object under study. Summary tables are compiled based on the results of mathematical data processing. The method of mathematical processing is determined with the supervisor. The design of the practice report must comply with the rules set out in the methodological recommendations of the CMO for practice. The supervisor, based on the submitted documentation, offers an assessment of the student's work in practice. The final assessment is made based on the results of the oral defense, where the student's knowledge of the material and competence in answering questions are evaluated.

7. List of basic and additional educational literature, periodicals necessary for mastering the practice

1. Basic literature

1. Kuznetsov I. N. Osnovy nauchnykh issledovaniy [Fundamentals of scientific research]: textbook for bachelors]. text data. - M.: Dashkov and K, 2014. - 283 p. - Access mode: http://www.iprbookshop.ru/24802. - EBS "IPRbooks", by password

2. Kuznetsov I. N. Osnovy nauchnykh issledovaniy [Fundamentals of scientific research]: textbook for bachelors]. text data. - M.: Dashkov and K, 2017. - 283 p. - Access mode: http://www.iprbookshop.ru/60483.html. - EBS "IPRbooks"
3. Gayrabekov R. Kh., Gayrabekova R. Kh., Dudurkhanova L. A. Laboratory practice on general microbiology. Grozny, 2010.
4. Labinskaya A. S. Practical guide to microbiological research, Moscow: State Publishing House of Medical Literature, 1963.
5. Medical microbiology. Part one./Edited by A.M. Korolyuk and V. B. Sboychakov.- St. Petersburg, 2002. - 267 p.
6. General and sanitary microbiology with microbiological research techniques: Textbook/Edited by A. S. Labinskaya, L. P. Blinkova, and A. S. Eshchina, Moscow: Meditsina Publ., 2004, 576 p.
7. Workshop of laboratory works with illustrated situational tasks on microbiology, immunology and virology/Edited by A. A. Vorobyov and V. N. Tsarev, Moscow: Meditsinskoe informatsionnoe agencie, 2008, 320 p. (in Russian).
8. Guide to Medical Microbiology. General and sanitary microbiology. Book 1 / Call. Authors/Ed. Labinskaya A. S., Volina E. G.-Moscow: BINOM Publishing House, 2008. - 1080s. Shklyar M. F. Osnovy nauchnykh issledovaniy [Fundamentals of scientific research] [Electronic resource]: textbook for bachelors]. text data. - M.: Dashkov and K, 2015. - 208 p. - Access mode: http://www.iprbookshop.ru/10946.html. - EBS "IPRbooks"

7.2 Additional literature

1. Donetskaya E. G.-A. Klinicheskaya microbiologiya: Rukovodstvo dlya spetsialistov klinicheskoi laboratornoi diagnostiki [Clinical microbiology: A guide for specialists in clinical laboratory diagnostics].

2. Private medical microbiology with the technique of microbiological research: A textbook/Edited by A. S. Labinskaya, L. P. Blinkova, and N. S. Yeshina, Moscow: Meditsina Publishing House, 2005, 600 p.

8. Approximate list of questions submitted for final control (test):

1. What methods of microscopy are available?

2. Rules of immersion microscopy.

3. Preparation of native preparations: "hanging drop", "crushed drop".

4. Lifetime staining of bacteria.

5. Preparation of fixed bacterial smears.

6. Structure of the bacterial cell.

7. What is simple coloring?

8. What is the principle of Gram coloring?

9. What inclusions can be contained in the cytoplasm of a bacterial cell? Their role in the life of bacteria?

10. What is the acid resistance of bacteria, what is it related to, and how is it detected?

11. The role of the capsule in the vital activity of the bacterial cell. Its chemical composition.

12. What methods are used to detect bacterial motility?

13. What is the process of bacterial spore formation?

14. What methods are used to detect bacterial spores?

15. Mechanism of Ziel-Nielsen staining?

16. What is the Burry-Gins coloring principle?

17. How can you detect the presence of volutin grains in bacteria?

18. What is the process of respiration in bacteria?

19. What types of bacteria are divided according to the method of respiration?

20. What changes occur in liquid nutrient media during bacterial growth?

21. What is pure culture?

22. What methods exist for isolating pure bacterial cultures?

23. What features of colonies have a differential meaning?

24. What role do bacterial pigments play?

25. What is the microflora of water?

26. What characterizes the air microflora?

27. What is the water coli-titer and coli-index, and what is their meaning?

28. What role do soil microorganisms play? What is the perfringence titer and how is it determined?

29. What are sanitary-indicative microbes? What microbes play a sanitary role for soil, water, and air?

30. What is the significance of normal microflora for a macroorganism?

31. What is dysbiosis and what are the causes of its occurrence?

9. Modern professional databases and information reference systems

- Electronic library system "IPRbooks" http://www.iprbookshop.ru/ – http://biobsu.org/phha/index.htm Microbiology Training Site

Online resources on microbiology

– http://www.iqlib.ru

Electronic library of educational and scientific publications.

– http://www.cir.ru

University Information System of Russia.

– http://www.diss.rsl.ru

Electronic library of dissertations of the Russian State Library. Includes full-text databases of dissertations.

10. Software composition

1. Use of slide presentations during practical classes;
2. Organization of interaction with students via e-mail (solving organizational issues consulting via e-mail).

List of licensed software

1. Agreement No. 658/2018 dated 24.04.2018 with Softex LLC for Kaspersky EndpointSecurity Educational Renewal software.
2. Agreement No. 298 dated 21.03.2018 with JSC "Antiplagiat" for the software " Antiplagiat. UNIVERSITY"
3. Contract No. 272/18-C dated 13.02.2018 with MMIS Laboratory LLC for software development

"Automation of educational process management"

4. Contract No. 1741 dated 15.012018 with Mintercom LLC for Rosmetod software

11. Equipment and technical means of training

Technical training tools

1. Audience equipped with presentation equipment (Epson video projector, stulus, remote control, screen, computer / laptop);
2. Set of electronic presentations/slides;
3. General-purpose application training software packages (text editors, image editors);

4. 4. Electronic library of the course.

Devices and equipment for educational purposes

Laboratories of the department on the basis of BHF and CCP, which have the following equipment:

1. Steam sterilizer BES-15L-LED-Nautomat

2. Drying cabinet SHS -40 (40l. 180C)

3. S series Medical Shaker:S -3. 02LA20

4. UV air recycling irradiator

5. Medical laboratory centrifuge

6. Micromed S-11 biological microscope with accessories

7. Scales Mass-1

8. Aquadistilator electric

9. Stand for test tubes SHPU Kron

10. Senco water bath, W-2-1003 p

11. Electric stove Irit IR-8201 1-komforochnaya with a thermostat

12. Measuring equipment

13. Savochek laboratory

14. Porcelain cups of different volumes

15. Small plastic petri dishes

16. Large plastic Petri dishes

MINISTRY OF SCIENCE AND HIGHER EDUCATION

OF THE RUSSIAN FEDERATION

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"CHECHEN STATE UNIVERSITY

NAMED AFTER AKHMAT ABDULHAMIDOVICH KADYROV"

FACULTY OF BIOLOGY AND CHEMISTRY

Department of Cell Biology, Morphology and Microbiology

Work program

«PRE-GRADUATE PRACTICE, INCLUDING RESEARCH WORK»

Training area Biology

***Code* 06.03.01**

Orientation (profile) Microbiology

Grozny, 2022

1. Goals and objectives of mastering the practice

Practice goal:

- formation of students ' skills and abilities to conduct independent scientific work, research, experimentation and completion of final qualification work.

Practice objectives:

− The main task of pre-graduate practice is to select the necessary materials for the final qualification work.

In the course of practical training, the student should study:

– literature sources on the research topic for the purpose of using them in the final qualification work;

– methods of analysis and processing of experimental data;

– requirements for the design of scientific documentation.

The student must complete:

анализ analysis, systematization and generalization of scientific information on the research topic;

– analysis of the reliability of the obtained results;

анализ analysis of the results obtained, their presentation in the form of a final qualification work;

– comparison of the results of the study with the data described in the literature;

analysis of the scientific and practical significance of the conducted research.

2. Type of practice, methods and forms of its implementation

Pre-graduate practice is conducted to complete the final qualification work

Type of practice – pre-graduate practice, including research work .

Form of conducting-discretely.

Methods of carrying out-stationary.

Type of practice – pre-graduate.

3. List of competencies formed by practice in the process of mastering the educational program

Competence group	Competence category	Code
Universal	Systems and critical thinking	UK-1.1; UK-1.2; UK-1.3; UK-1.4; UK-1.5
	Development and implementation of projects	UK-2.1; UK-2.2; UK-2.3; CC-2.4
	Teamwork and leadership	UK-3.1; UK-3.2; UK-3.3; CC-3.4; UK-3.5
	Communication	UK-4.1; UK-4.2; UK-4.3; UK-4.4
	Cross-cultural interaction	UK-5.1; UK-5.2; UK-5.3; UK-5.4
	Self-organization and self-development (including health protection)	UK-6.1; UK-6.2; UK-6.3; CC-6.4
		UK-7.1; UK-7.2; UK-7.3; UK-7.4
	Life safety	UK-8.1; UK-8.2; UK-8.3; UK-8.4
	Inclusive competence	UK-9.1; UK-9.2; UK-9.3
	Economic culture, including financial literacy	UK-10.1; UK-10.2; UK-10.3
	Civil position	UK-11.1; UK-11.2; UK-11.3
General professional services	General professional skills	OPK-1.1; OPK-1.2; OPK-1.3; OPK-1.4
		OPK-2.1; OPK-2.2; OPK-2.3
		OPK-3.1; OPK-3.2; OPK-3.3; OPK-3.4; OPK-3.5
		OPK-4.1; OPK-4.2; OPK-4.3
	Professional activity	OPK-5.1; OPK-5.2; OPK-5.3
		OPK-6.1; OPK-6.2; OPK-6.3
	Information and communication activities	OPK-7.1; OPK-7.2; OPK-7.3
	Presentation of the obtained results of the activity	OPK-8.1; OPK-8.2; OPK-8.3

Professional services	Ability to operate state-of-the-art equipment and equipment for performing scientific research field and laboratory biological work	PC-1.1; PC-1.2; PC-1.3
	Ability to use knowledge of individual sections of microbiology in professional activities, to use modern ideas about the role, structure, and properties of microorganisms in professional activities; to apply methods for analyzing microbiological material	PC-2.1; PC-2.2; PC-2.3
	The ability to participate in work in industrial production and in the field of medical and environmental biotechnology.	PC-3.1; PC-3.2; PC-3.3
	Ability to carry out teaching activities in the field of pre-school, primary, basic and secondary general education and in additional programs in accordance with the obtained qualification	PC-4.1; PC-4.2; PC-4.3

Competencies, indicators of their achievement and results of practical training

Competence codes	Content of competencies	List of planned results of training in the discipline
UK-1	It is able to search, critically analyze and synthesize information, apply a systematic approach to solving tasks.	*To know:* - the task is decomposed by selecting its basic components. *Can:* - choose resources to search for information needed to solve the task at hand - find, critically analyze, compare, systematize and generalize the discovered information, determine the paradigm within which the task will be solved - identify system connections and relationships between the studied phenomena, processes and / or objects based on the accepted paradigm. *Own:*

		- It evaluates the advantages and disadvantages (theoretical problems), advantages and risks (practical problems).
UK-2	It is able to determine the range of tasks within the set goal and choose the best ways to solve them, based on current legal norms, available resources and restrictions.	*To know:* - methods of developing the project, determining its ultimate goal, based on the current legal norms Can: - to solve the sub-goal of the project assigned to them, through the formulation of specific tasks - take into account labor and material resources, project limitations - terms, cost, content-when solving tasks. Owns: - skills of working on documentation, publicly presents the results of solving a specific project task or the project as a whole
UK-3	Able to engage in social interaction and fulfill your role in the team	*To know:* - basic principles of assigning and delineating roles in a team. Can: - build a social dialogue taking into account the main patterns of interpersonal interaction - anticipate and prevent conflicts in the process of social interaction; - show willingness to perform various roles in the team to maximize the effectiveness of the team. Owns: - techniques for establishing interpersonal and professional contacts, developing professional communication, including in international teams
UK-4	Able to carry out business communication in oral and written forms in the state language of the Russian Federation	*To know:* - the system of norms of the Russian literary language and the norms of the foreign language (s) ; Can:

	and foreign language(s)	- logically and grammatically correct construction of oral and written speech; - competently build communication based on the goals and situation; uses communicatively acceptable communication style, verbal and non-verbal means of interaction with partners - translate texts of a foreign language (s) into the state language, as well as from the state language into a foreign language (s). Owns: - ways of free perception, analysis and critical evaluation of oral and written business information in Russian, native and foreign language (s).
UK-5	It is able to perceive the cross-cultural diversity of society in socio-historical, ethical and philosophical contexts.	*Can:* - demonstrate a tolerant perception of social, religious and cultural differences, respect and respect for historical heritage and cultural traditions - find and use information necessary for interaction with other people about the cultural characteristics and traditions of various social groups - to show in their behavior a respectful attitude to the historical heritage and socio-cultural traditions of various social groups, based on knowledge of the stages of historical development of Russia in the context of world history and cultural traditions of the world *Owns:* - philosophical knowledge for the formation of a worldview position that presupposes the adoption of moral obligations towards nature, society, other people and oneself
UK-6	Able to manage your time, build and implement a trajectory of self-development based on the principles of lifelong education	*Can:* - evaluate personal resources to achieve your time management goals for successful completion of assigned work and self-development - critically evaluate the effectiveness of time use in solving tasks, as well as in relation to the result obtained

		- shows interest in self-development and uses the opportunities provided to acquire new knowledge and skills, based on the idea of continuing education throughout life Owns: - various technologies of self-improvement and self-development, techniques for achieving personal effectiveness.
UK-7	Able to maintain the proper level of physical fitness to ensure full-fledged social and professional activities	*Can:* - analyze and critically reflect on the impact of lifestyle on health indicators and physical fitness of a person, including their own - freely navigate the norms of a healthy lifestyle, health-saving technologies, methods and means of maintaining the level of physical fitness - choose methods and means of physical culture and sports for maintaining one's own level of physical fitness, restoring working capacity in conditions of increased nervous tension, and correcting one's own health *Owns:* - ideas about rational methods and techniques for the prevention of occupational diseases, psychophysical and neuropsychiatric fatigue in the workplace
UK-8	It is able to create and maintain safe living conditions in everyday life and in professional activities to preserve the natural environment, ensure sustainable development of society, including in the event of threats and emergencies and military conflicts	*To know*: - basic information security requirements. *Can:* - provide first aid to the injured person; - freely navigate the choice of rules of conduct in the event of an emergency of natural, man-made or social origin. *Owns:* - basic information security requirements; - knowledge in the field of occupational safety and health;
UK-9	Able to use basic defectological	*To know:*

	knowledge in social and professional spheres	- psychophysical features of the development of children with mental and (or) physical disabilities, patterns of their education and upbringing, features of the application of basic defectological knowledge in social and professional spheres *Be able to:* - plan and carry out professional activities based on the application of basic defectological knowledge with a different contingent *Owns:* - skills of interaction in the social and professional spheres with persons with various psychophysical characteristics, mental and (or) physical disabilities, based on the application of basic defectological knowledge
UK-10	Able to make informed economic decisions in various areas of life	*Knows:* - the main documents regulating financial literacy in professional activities; sources of financing for professional activities; principles of planning economic activities; criteria for evaluating costs and the validity of economic decisions. *Can:* - justify the adoption of economic decisions in various areas of life based on efficiency factors; plan activities taking into account the economic impact of the Company's activities. reasonable expenses aimed at achieving the result. *Own:* - methodology for analyzing, calculating and evaluating the economic feasibility of the planned activity(project), its financing from extra-budgetary and budgetary sources.
UK-11	Able to form an intolerant attitude to corrupt behavior	*To know:* - regulatory legal and other acts in the field of anti-corruption *Own:* - skills of anti-corruption behavior - the conceptual framework of corrupt behavior
OPK-1	Able to apply knowledge of biological diversity	*To know:*

	and use methods of observation, identification, classification, reproduction and cultivation of living objects to solve professional tasks	- theoretical foundations of microbiology and virology, botany, zoology and uses them to study the life and properties of living objects, their identification and cultivation *Be able to:* - apply methods of observation, classification, and reproduction of biological objects in natural and laboratory conditions; use the knowledge gained to analyze the interactions of organisms of different species with each other and with the environment. *Own:* - experience in monitoring and protecting biological resources, using biological objects to analyze the quality of their habitat - concepts of the role of biological diversity as a leading factor in the sustainability of living systems and the biosphere as a whole.
OPK-2	It is able to apply the principles of structural and functional organization, use physiological, cytological, biochemical, and biophysical analysis methods to assess and correct the state of living objects and monitor their habitat.	*To know:* - basic systems of life support and homeostatic regulation of vital functions in plants and animals, methods of perception, storage and transmission of information, is guided in modern methodological approaches, concepts and problems of physiology, cytology, biochemistry, biophysics. *Be able to:* - to select methods that are adequate for solving the research problem; to identify links between the physiological state of the object and environmental factors. *Own:* - experience in applying experimental methods to assess the state of living objects.
OPK-3	He is able to apply knowledge of the basics of evolutionary theory, use modern ideas about the structural and functional organization of the genetic program of living objects and methods of molecular	To know: - fundamentals of evolutionary theory, analyzes current trends in the study of evolutionary processes, development history, principles and methodological approaches of general genetics, molecular genetics, population genetics, epigenetics. *Umet*b:

	biology, genetics and developmental biology to study the mechanisms of ontogenesis and phylogenesis in professional activities.	- to use in professional activity modern ideas about the manifestation of heredity and variability at all levels of the organization of living things; to use in professional activity ideas about the genetic foundations of evolutionary processes, genomics, proteomics, and developmental genetics; - use in professional activity modern ideas about the mechanisms of growth, morphogenesis and cytodifferentiation, the causes of developmental anomalies. *Own:* - basic methods of genetic analysis - methods of obtaining embryonic material; reproduction of living organisms in laboratory and industrial conditions.
OPK-4	Able to carry out measures for the protection, use, monitoring and restoration of bioresources, using knowledge of the laws and methods of general and applied ecology	*Znaet:* - fundamentals of interactions of organisms with their environment, environmental factors and mechanisms of response of organisms, principles of population ecology, community ecology; fundamentals of organization and management of the environment. sustainability of ecosystems and the biosphere as a whole. *Be able to:* - use methods of analysis and modeling of environmental processes, anthropogenic impacts on living systems, and environmental forecasting in their professional activities; substantiate environmental principles of rational use of natural resources and nature protection. *Own:* - skills in identifying and predicting the response of living organisms, communities, and ecosystems to anthropogenic impacts, and determining environmental risk.
OPK-5	He is able to apply modern ideas about the basics of biotechnological and biomedical production, genetic engineering, nanobiotechnology, and molecular	*To know:* - principles of modern biotechnology, techniques of genetic engineering, fundamentals of nanobiotechnology, molecular modeling. *Be able to:* - evaluate and predict the prospects of the objects of their professional activity for biotechnological industries.

	modeling in his professional activities.	*Own:* - methods for determining the biological safety of products of biotechnological and biomedical industries.
OPK-6	He is able to use the basic laws of physics, chemistry, Earth sciences and biology in his professional activity, apply methods of mathematical analysis and modeling, theoretical and experimental research, acquire new mathematical and natural science knowledge using modern educational and information technologies.	*To know:* - *basic concepts and methods, current trends in mathematics, physics, chemistry and Earth sciences, current problems of biological sciences and prospects* *interdisciplinary research"* *Be able to:* - use laboratory skills and methods of chemistry, physics, and mathematical analysis in your professional activities. *Own:* - methods of statistical assessment and hypothesis testing, forecasting the prospects and social consequences of their professional activities.
OPK-7	Able to apply modern information and communication technologies to solve standard professional tasks, taking into account the requirements of information security;	*To know:* - principles of information analysis, basic reference systems, professional databases, information security requirements. *Be able to:* - use modern information technologies for self-development and professional activities and business communication. *Own:* - culture of bibliographic research and formation of bibliographic lists.
OPK-8	He is able to use methods of collecting, processing, systematizing and presenting field and laboratory information, apply skills in working with modern equipment, and analyze the results obtained.	*To know:* - the main types of expedition and laboratory equipment, features of the chosen object of professional activity, conditions for its maintenance and work with it, taking into account the requirements of bioethics. *Be able to:* - analyze and critically evaluate the development of scientific ideas, draw up a plan for solving the problem on the basis of

		available resources, select and modify methodological techniques. *Own:* - skills of using modern equipment in field and laboratory conditions, the ability to correctly justify the tasks set in the context of the current state of the problem, the ability to use mathematical methods for evaluating hypotheses, processing experimental data, mathematical modeling of biological processes and adequately assess the reliability and significance of the results obtained, present them to a wide audience and conduct a discussion.
PC-1	Ability to operate state-of-the-art equipment and equipment for performing scientific research field and laboratory biological work	*Knows* device and principles of operation and control of the equipment used; safety rules when working on the equipment used; possible areas of use of equipment and equipment for performing biological research; basic principles of preparation and conduct of scientific research field and laboratory biological work\ *Can* perform field and laboratory biological studies using state-of-the-art equipment and equipment\ *Owns* skills of working on modern equipment and equipment for performing scientific research field and laboratory biological work.
PC-2	Able to use knowledge of individual sections of microbiology in professional activities, use modern ideas about the role, structure, and properties of microorganisms in professional activities; apply methods for analyzing microbiological material	*Knows* basic systems of life support and regulation of vital functions of microorganisms, structure and properties of pathogenic and opportunistic microorganisms; fundamentals of interaction of microorganisms with their environment, sanitary and microbiological standards for the state of environmental objects, food and beverages; methods of microbiological diagnostics and prevention. *Can* use knowledge about the vital activity of microorganisms in professional activities Provides sanitary and hygienic requirements when performing microbiological work; technical support of microbiological work: preparation of laboratory utensils and tools, preparation of reagents and nutrient media for growing microorganisms Able to participate in microbiological control of food safety and the environment of organisms. *Owns* theoretical foundations and technology of modern microbiological and biotechnological industries.
PC-3	Able to participate in work in industrial	*Knows* the main types of microbial production: based on the use of live or inactivated biomass of microorganisms;

	production and in the field of medical and environmental biotechnology.	producing products of microbial biosynthesis; production based on the production of fermentation and putrefaction products.
PC-4	Able to carry out teaching activities in the field of pre-school, primary, basic and secondary general education and in additional programs in accordance with the obtained qualification	*Knows* principles of organization of students ' activities aimed at mastering biological disciplines and additional general education programs. *Getting sick* methods of teaching and monitoring and evaluating the development of program material.

4. Scope of practice

Scope of practice in credit units and its duration in weeks or in academic or astronomical hours: the duration, terms of completion and volume of credit units of pre-graduate practice is determined by the curriculum in accordance with the Federal State Educational Standard for the direction of training 06.03.01 "Biology", profile "Microbiology".

Types of academic work	Labor intensity, hours / month	
	OFO	OZFO
No. of semesters	8	9
Total labor intensity: credits / hours	216/6	216/6
Contact work with the teacher:	148	148
Individual and group consultations	4	4
Intermediate certification: Credit / credit with assessment / exam /	Credit with a score	Credit with a score
Practical work supervised by a teacher	144	144
Number of weeks	4 weeks	4 weeks
Dates of the event	24.04-24.05.	24.04.-24.05.

5. Practical training content, structured by topic / section with an indication of the number of academic hours allocated to them and the types of training sessions

№ of the section	Name of practice stages	Section content	Current control form

1	2	3	4
1	Compiling a bibliography on the topic of the final qualification work	1.1. Index of literary sources. Literary sources include monographs of one author, monographs of a group of authors, dissertation abstracts, dissertations, articles in a collection of scientific papers, articles in scientific journals, and so on.	Supplement to Chapter 1 of the final qualification work "Literature review".
2	Organization and conduct of research on the problem, processing of practical material, empirical data and their interpretation	2.1. Description of the organization and methods of research (second chapter of the final qualification work). 2.3. Drawing up a list of materials or experimental results obtained on the topic of scientific research.	Interpretation of the results obtained in descriptive and illustrative design
3	Presentation at the pre-defense of the final qualification work	Conclusion of the graduating department on the level of research culture and admission to the defense of the final qualification work	Research report with multimedia presentation
4	Research Practice Report	6.1. Report on research practice. 6.2. Characteristics of the supervisor about the results of research of students.	

FULL-TIME EDUCATION

5.1. Practice Sections

№ once-affairs	Section names	Number of hours
1	2	
1	Compiling a bibliography on the topic of the final qualification work	50
2	Organization and conduct of research on the problem, processing of practical material, empirical data and their interpretation	150
3	Presentation at the pre-defense of the final qualification work	2
4	Research Practice Report	14
total:		216

FULL-TIME AND PART-TIME EDUCATION

5.1. Practice Sections

№ once-affairs	Section names	Number of hours
1	2	
1	Compiling a bibliography on the topic of the final qualification work	50
2	Organization and conduct of research on the problem, processing of practical material, empirical data and their interpretation	150
3	Presentation at the pre-defense of the final qualification work	2
4	Research Practice Report	14
total:		216

6. Fund of assessment funds for conducting practical certification of students

Upon completion of the internship, the student submits the following documentation::

- calendar and thematic work plan for the internship period;
- laboratory journal of research in any of the areas of research work per person;
- pre-graduate practice report;
- review of the academic supervisor or supervisor from the organization about the course practice by a student.

The results of the internship are made out by students in the form of reports, which are defended at the meeting of the department. Based on the results of the defense, the student receives an assessment. The report on the results of pre-graduate practice includes::

- general information about the goals and objectives of the practice;
- justification of the relevance of the chosen topic;
- assessment of the current state of the problem (literature review);
- information about the equipment used, research methods, and methods of processing the results;
- results obtained and their interpretation;
- key findings;
- list of used literature;

– list of experimental results.

A report verified and signed by the supervisor (and, if necessary, a laboratory journal) is submitted to the department.

The report on pre-graduate practice is defended at a meeting of the department.

The student makes a report lasting no more than 10 minutes (an illustrative material is presented - a presentation), in which he sets out the results obtained, gives their interpretation and reads out the conclusions. Then the bachelor student answers questions on the subject of the work.

The form of intermediate control is differentiated credit.

6.1 Passport of the assessment fund for conducting current practice certification

No. p / p	Controlled sections (topics)	Name of the appraisal tool
1	Organizational and preparatory stage of the internship	Individual practice plan
2	Experimental stage of practice	Internship Diary
3	Graduation design qualification work	Practice report presentation Practice report

6.2 Standard control tasks or other materials necessary for assessing knowledge, skills, and /or experience **in the current monitoring process**

Individual practice plan

An individual internship plan is drawn up by the supervisor together with the student and must be approved by a representative of the institution where the intern will consolidate the practical skills previously acquired in industrial practice.

The curator schedules practical work in detail by day and allocates a certain amount of time for analyzing the results obtained and writing a report.

Internship Diary

The results of the individual plan are reflected in the practice diary, which is based on the schedule compiled by the supervisor. The diary is an expanded and expanded calendar plan, in which each day must be confirmed by a personal signature of the curator from the production. The schedule includes an individual practice assignment.

The internship diary is intended for independent work of the student and allows you to assess the level of assimilation of educational material.

The student daily records all types of work performed during the internship, certified by the head of the internship. In the diary, the head of the practice draws up a description of the student.

Presentation of the practice report

Creating a presentation on pre-graduate practice is the final step in preparing for the defense. It is the main tool of the intern when receiving the final assessment.

The oral presentation of the work done during the practice takes place in the form of a report and is accompanied by a computer presentation created in the Microsoft PowerPoint program. The computer presentation may include photographs, drawings, summaries of literature sources, glossaries, analytical reviews, and other additional materials confirming the completion of practical tasks. The usual way to build slides: text, drawing, or photo. The text is printed in a straight font. Slides should not be overloaded with animation.

Practice Report

Upon completion of the internship, the student submits the following documentation::

- practice diary with an individual and calendar plan;
- laboratory journal of research in any of the areas of research work per person;
- pre-graduate practice report;
- review of the academic supervisor or supervisor from the organization about the course practice by a student.

The results of the internship are made out by students in the form of reports, which are defended at the meeting of the department. Based on the results of the defense, the student receives an assessment. The report on the results of pre-graduate practice includes::

- general information about the goals and objectives of the practice;
- justification of the relevance of the chosen topic;
- assessment of the current state of the problem (literature review);
- information about the equipment used, research methods, and methods of processing the results;
- results obtained and their interpretation;
- key findings;
- list of used literature;
- list of experimental results.

A report verified and signed by the supervisor (and, if necessary, a laboratory journal) is submitted to the department.

The report on pre-graduate practice is defended at a meeting of the department.

The student makes a report lasting no more than 10 minutes (an illustrative material is presented - a presentation), in which he sets out the results obtained, gives their interpretation and reads out the conclusions. Then the bachelor student answers questions on the subject of the work.

Practical training stages

Evaluation stage	Evaluation result	Evaluation
1	Internship Diary	
2	Report on the results of the internship	
3	Review of the supervisor	
4	Portfolio	
5	Practice report	
6	Final assessment based on the results of the internship	

6.3 Methodological materials defining procedures for assessing knowledge, skills, abilities and (or) work experience

Individual practice plan

The individual practice plan is a scheme of research undertaken by the student, it consists of a list of areas of work related to the internal logic within the framework of the planned research. It includes a research calendar plan that defines specific calendar dates for completing these works. The practice calendar is one of the main elements of the practice report in accordance with GOST 2020 standards.

The individual practice plan according to GOST 2020 is drawn up in the form of a table and must include information about the planned work, the timing of these events,the place of practical tasks and classes. In the practice calendar, a note must be made about the completion/non-completion of an event. An individual internship plan allows you to see what activities are planned for the intern, whether they are performed exactly on time, and how well these activities correspond to the topic of the student's future final qualification work.

Criteria for evaluating competencies

- lists the activities of the intern in accordance with the approved program of pre-graduate practice;

- the deadlines for completing the main activities of the intern in accordance with the approved program of pre-graduate practice are indicated;

- marks on the implementation of the main activities of the intern in accordance with the approved program of pre-graduate practice are indicated;

− there is a note on the approval of the individual plan of pre-graduate practice with the head in accordance with the approved order − there is a personal signature of the bachelor.

Competence assessment scale

The individual task is evaluated using the "credited" / "not credited"system.

The "credited" rating corresponds to the implementation of the individual pre-graduate practice plan.

Practice Diary

Practice diary is a document that allows you to assess the type, nature and volume of work done by the student in practice, the degree of compliance with the content of the practice, the individual schedule (plan) of the practice. The pre-graduate practice diary should be filled out in accordance with the established form.

The diary, along with the internship report, is the main document used by the student to report on the implementation of the program and individual practice tasks.

During the practice, the student writes down in a diary every day briefly and accurately everything that they have done all day to complete the practice program and individual tasks.

At least once a week, the student must submit the diary for review to the head of the practice, who signs the diary after viewing, makes comments and, if necessary, issues additional tasks.

At the end of the internship, the student must submit the diary to the head of the practice for final review and review.

The diary must be properly designed, have signatures and the seal of the institution.

Individual practice diary includes:

1. General information
2. Date of internship completion
3. Individual task of the student on practice
4. Information about work during the internship period
5. Characteristics of the student from the supervisor

Within the prescribed period, the student must submit the practice diary to the head of the practice.

In the absence of a diary, practice is not counted for this student.

Criteria for evaluating competencies

1	Compliance of the diary structure with the requirements / availability of all sections

2	Availability of a practice plan that allows you to clearly define the type of student activity, the time spent on each type of task
3	Compliance of records with the requirements, according to which it is possible to clearly distinguish what the student saw and observed, what they conducted independently
4	Literacy of presentation and quality of work design
5	Timely registration and delivery of the diary

Competence assessment scale

Assessment is made on a 4-point scale ("excellent", "good", "satisfactory", "unsatisfactory").

"Excellent"	− correspondence of the diary content to the internship program – the diary corresponds to the internship program; − structure (clarity of presentation of the material, compliance with the internship schedule); − all components of the diary are filled in in full; − the deadline for submitting your diary has not been violated
"Good"	− correspondence of the diary content to the internship program – the diary corresponds to the internship program; − not everywhere you can trace the structure (clarity of presentation of the material, there are discrepancies with the schedule of practical training); − all components of the diary are filled in in full; − the deadline for submitting your diary has not been violated
"Satisfactory"	− correspondence of the diary content to the internship program – the diary corresponds to the internship program; − not everywhere you can trace the structure (clarity of presentation of the material, there are discrepancies with the schedule of practical training);
	− the components of the diary are not fully filled in; − in the design of the diary, carelessness can be traced; − the deadline for submitting your diary has been violated

"Not satisfactory"	− correspondence of the diary content to the internship program – the diary does not correspond to the internship program; − broken structure, logic of the diary (does not correspond to the schedule of practical training); − the components of the diary are not filled in; − in the design of the diary, carelessness can be traced; − the deadline for submitting your diary has been violated

Presentation of the practice report

A presentation for the practice defense must meet the following requirements::

- the presentation should not be overloaded with the number of slides, usually it does not exceed 15-20;
- the scenario and uniform design style are developed in advance, and then refined in the process;
- when developing a style, take into account the font type and color scheme;
- It is not recommended to combine more than three colors on a single slide, and the background color should contrast with the text and title.
- preferably, there should be text slides and separate slides with graphic images and drawings;
- a text slide consists of a title (font not less than 24) and brief but succinct information (font not less than 18).;
- the title and nodal information elements should be highlighted in bold, italics, underscores, and color.
- As a rule, one node element is shown on one slide.

In addition to the correct placement of text blocks, you should also remember about their content-the text. In no case should it contain spelling errors. You should also take into account the general rules of text formatting. Slides are formed in the following order:

- title page;
- goals and objectives of the practice;
- the main part;
- conclusion (s);
- list of literature.

Before the defense, the presentation must be shown to the supervisor and get his approval. Additionally, the student must prepare a speech for the defense, which will contain all the information clearly shown in the presentation.

Criteria for evaluating competencies

1	Clear, logical, consistent disclosure of the content of the sections of the presentation, indicating their professional competence
2	Proficiency in public speaking skills (logic of reasoning, speech culture, ability to reasonably answer questions from the commission)
3	Compliance with the rules of presentation of the report on practice (the student is given 5-7 minutes)

Rating scale

Assessment is made on a 4-point scale ("excellent", "good", "satisfactory", "unsatisfactory").

Individual task	
5 "excellent"	Individual task completed in full. An analysis of the practice was carried out with the use of additional literature. The conclusions are justified
4 "good"	Individual task completed. The analysis of practice is carried out without involving additional literature. Not all conclusions are made and / or justified
3 "satisfactory"	The individual task wasn't fully completed. Conclusions are not drawn and / or conclusions are not justified
2 (unsatisfactory)	Individual task completed failed. Missing conclusions
Performance	
5 "excellent"	The information provided is systematic, consistent, and logically linked. More than 5 professional terms were used
4 "good"	The information provided is systematic and consistent. More than 2 professional terms were used
3 "satisfactory"	The information provided is not systematic and / or consistent. 1-2 professional terms were used
2 (unsatisfactory)	The information presented is not logically related. Professional terms are not used
Decoration	
5 "excellent"	Information technologies (Power Point) are widely used. There are no errors in the submitted information
4 "good"	Information technologies (Power Point) were used. No more than 2 errors in the submitted information
3 "satisfactory"	Information technologies (Power Point) were partially used. 3-4 errors in the submitted information

2 (unsatisfactory)	No information technologies (Power Point) were used. More than 4 errors in the submitted information
Answers to questions	
5 "excellent"	Answers to questions are complete with ghostly examples and / or explanations
4 "good"	Answers to questions are complete and / or partially complete
3 "satisfactory"	Only answers to basic questions
2 (unsatisfactory)	No answers to questions

Practice Report

The report on pre-graduate practice is the most important, because it is the final stage of work on the final qualification work (WRC). During the pre-graduate internship, the student must finally approve the topic of their diploma. The main task of the intern is to gain new knowledge and find materials that will complement his final work.

The practice report includes the following sections::

1. title page;
2. introduction;
3. the main part;
4. conclusion;
5. applications.

Title page of the practice report

According to GOST 2020 standards, it should contain the following information::

– in the header, name of the educational institution, faculty, or department;

– the title page of the internship report must contain the name of the report type – pre-graduate;



- name of the topic of the final qualification work in the title page of the internship report;

– surname and regalia of the supervisor/supervisor

practice sessions.

The title page of the practice report is the very first page of your report, which means that it will attract special attention. Carefully check the spelling of all names and surnames.

Introduction of the practice report

Introduction of the practice report is the main element of the report structure itself. The introduction of the practice report should highlight the most significant points, and its content should include the following sections::

- relevance;
- purpose and objectives of the practice;
- subject and object of practice;
- current status of the topic under study;
- it can contain the results that you plan to achieve.

Main part of the practice report

The main part of the internship report contains all the information received by the intern during the internship. Usually the content of the main part of the practice report has 2 chapters:

– Chapter 1 is a theoretical part,

- Chapter 2 describes the practical nature of the topic under study.

In the first chapter of the main part of the practice report according to GOST 2020 standards, the main general characteristics of the organization or institution where the practice takes place are given. Here you can provide a description of the object and conditions of research. When mastering the techniques, you need to understand what they are based on, who their author is, and also carefully take notes on them.

In the main part of the practice report, the second chapter is a practical one, where experimental material is presented. All the obtained experimental material should be analyzed using modern methods used for the object under study. Summary tables are compiled based on the results of mathematical data processing. The method of mathematical processing is determined by the supervisor. *Conclusion of the practice report*

The conclusion of the internship report is one of the main parts of the report. It should contain the main conclusions made during the internship.

It provides a general assessment of the institution's activities, as well as prescribes the work done by the intern. The conclusion of the practice report also describes the goals achieved and all completed tasks set out in the introduction. The conclusion of the practice report is most often checked by the teacher with special care. *Appendices to the practice report*

Appendices to the practice report are not a mandatory element, their presence is determined by the student himself. Usually, various types of graphic material are included in the appendices to the practice report: tables, diagrams, diagrams, drawings, questionnaires, and so on. They are needed in order to describe the organization's activities more fully and concisely, without overloading the main part of the practice report.

Criteria for evaluating competencies

- completeness of implementation of the internship program (evaluated based on the submitted materials);
- implementation of individual practice plans for all positions (evaluated based on the materials presented in the report);
- compliance with the requirements for the form and content of internship materials (reflecting all types of work provided for in the internship program and plan, availability of supporting documents and materials on the performance of these works).

Rating scale

The form of intermediate control is differentiated credit. Assessment is made on a 4-point scale ("excellent", "good", "satisfactory", "unsatisfactory").

Rating "excellent"	– availability of a positive characteristic(review), diary, practice report; – demonstration of deep general theoretical training; – demonstrated the ability to generalize, analyze the material, draw conclusions; meaningful and correct answers to control questions and tasks for each indicator of competence formation
Rating "good"	– availability of a positive profile, diary, or practice report; – demonstration of deep general theoretical training; – demonstrated the ability to generalize, analyze the material, draw conclusions; – meaningful and correct answers to control questions and tasks for each indicator of competence formation, minor difficulties and contradictions in the answers
Evaluation "satisfactory"	– availability of a positive profile, diary, or practice report; – demonstration of general theoretical training; – insufficient skills to generalize, analyze the material, and draw conclusions are shown; – the answers to the control questions and tasks for each indicator of competence formation are insufficient, and difficulties are found in the answers
Evaluation "unsatisfactory"	– absence of either a positive characteristic, or a diary, or a report on the practice; – weak general theoretical framework; – there are no skills to generalize, analyze material, or draw conclusions; – there are no answers to control questions and tasks for each indicator of competence formation, and fundamental mistakes were made

Guidelines for students to master the practice

Scientific supervisors at the department's meeting analyze students 'work in practice (the timeliness of students' arrival to practice, the completeness and quality of individual tasks), the feasibility of further use of practice databases, and make suggestions for improving practice.

Before practice, the student gets acquainted with the disciplines related to the focus of pre-graduate practice.

Each student is assigned to a supervisor who is appointed by the department. He / she supervises the final qualification work of the student.

If the internship is held in another institution, the internship plan is discussed with the supervisor from the organization that acts as the practice base. The supervisor makes estimates for material support, travel expenses, and draft orders for practical training.

Guidelines for students

During the internship, the student keeps a diary, where he keeps daily records of the work done, certified by the supervisor or curator of the internship. In the diary, the head of the practice draws up a description of the student.

At the end of the internship, the student draws up a report on the practice, which is defended at a meeting of the department. Based on the results of the report, an assessment is made and a conclusion is made about the possibility of writing a final work. The report is defended at a meeting of the department in the form of a pre-defense of the final qualification work.

When working independently, the student should pay attention to the justification of the purpose and objectives of the practice, study methods and equipment, and it is recommended to take an active part in all stages of conducting experimental and theoretical work for writing the final qualification work.

During the internship, research works are carried out, methods of studying biological material are mastered, primary processing and interpretation of the obtained data is carried out, and literature sources on the research topic are analyzed. At the same time, a different arsenal of equipment, computer equipment and software is used.

Working with special literature

The student should study the main monographs, dissertations (if possible), theses, view specialized journals. A bibliographic card and abstract should be compiled for each source. If there are articles on the subject under study in journals, they are summarized with the compilation of bibliographic cards. The student needs to analyze the intensity of publications on this topic in journals. At the end of the internship, the student must submit to the supervisor a card file, essays and summaries of literary sources.

At the end of the internship, the student must provide a literature review on the subject being studied.

Collecting factual material

The student must prepare a description of the object and conditions of research. When mastering the techniques, you need to understand what they are based on, who their author is, and also carefully take notes on them. Data from observations and experiments must be entered in the work logs. On the cover of the journal, the subject, performer, and terms of research are indicated. Make sure to create a list of symbols that are used in records. Records should be kept clearly, accurately, with dates and units of measurement indicated. Working journals are reviewed and certified by scientific supervisors.

Analysis and processing of the material

All the obtained factual material should be analyzed using modern methods used for the object under study. Summary tables are compiled based on the results of mathematical data processing. The method of mathematical processing is determined by the supervisor.

The design of the practice report must comply with the rules set out in the practice guidelines.

Guidelines for the head of practice

For each student-intern, the supervisor draws up an individual work plan in accordance with the topic of the final qualification work, which is entered in the practice diary, and the terms of practice are also indicated there. The head and curator of the internship should familiarize the student with the rules of occupational health and safety.

At all stages of the internship, the student's supervisor provides consulting assistance, corrects the student's work. Work with literature, collection of factual material is carried out by the student independently, but under the constant supervision of the supervisor.

The supervisor, based on the submitted documentation, offers an assessment of the student's work in practice. The final assessment is made based on the results of the oral defense, where the student's knowledge of the material and competence in answering questions are evaluated.

7. List of basic and additional educational literature, periodicals necessary for mastering the practice

7.1 Basic literature

1. Galaktionova L. V., Rusanov A.M., Vasilchenko A.V. Uchebno-metodicheskie osnovy podgotovki vysshnoy kvalifikatsionnoy raboty [Educational and methodological bases of preparation of final qualification work]. text data. Orenburg: Orenburg State University, EBS DIA, 2014, 98 p. (in Russian). - Access mode: http://www.iprbookshop.ru/33662. – EBS "IPRbooks", by password

7.2 Periodicals

1. Advances in modern biology. - M.: Science
2. Bulletin of Moscow State University. Series 16. Biology. - Moscow: MSU
3. Bulletin of TSU. Biology. - Tomsk: TSU
4. Bulletin of St. Petersburg State University. Series 3. Biology. - St. Petersburg: St. Petersburg State University
5. Izvestiya RAS. The series is Biological. - M.: Science

8. Modern professional databases and information reference systems

- Electronic library system "IPRbooks" http://www.iprbookshop.ru/

- Website of the Russian Open Education Portal - http://www.openet.ru/

- Website of the Russian Open Education Portal - http://www.openet.ru/

- Single window of access to educational resources website - window.edu.ru - Biology;

http://e.lanbook.com/books/element.php?pl1_cid=25&pl1_id=4115 EBS Doe

9. Software composition

- use of slide presentations during practical classes;

- organization of interaction with students via e-mail (solving organizational issues consulting via e-mail).

List of licensed software

1. Softex LLC by Kaspersky Endpoint Security Educational Renewal.
2. JSC "Antiplagiat" PO " Antiplagiat. UNIVERSITY"
3. MMIS Laboratory LLC Software "Automation of educational process management" 4. LLC "Mintercom" on the software "Rosmetod"

10. Equipment and technical means of training

1. Audience equipped with presentation equipment (Epson video projector, stulus, remote control, screen, computer / laptop);

2. Set of electronic presentations/slides;

3. Packages applied training programs general purpose (text editors, image editors);

4. Electronic library of the course.

List of devices and equipment used in conducting students ' pre-graduate practice

Laboratories of the department on the basis of the Faculty of Biology and Chemistry and the center for collective use of scientific and testing equipment, which have the following equipment:

1. Laboratory of Microbiology and Virology (4-15, 4-13)

№ n/a	Name of the complex, installation, or system

1	TS - 1/80 SPU thermostat with cooling
2	microscopes (monocular-BIOMED -1 ; BIOME -2, binocular-MICROMED 1, stereoscopic pancratic MS-4-ZOOM LED)
3	fridge
4	scales, kettlebell K 500 g F 2 (+) C-S
5	laboratory utensils
6	pH meter "ANION-4100", pH meter pH-150MI
7	S-Series Medical Shaker: S-3.02 L. A20,
8	water bath
9	spirit lamps
10	ToupCam 5.1 MP Video Eyepiece
11	porcelain cups
12	Distiller (aquadistillator electric LISTON A 1204, bidistillator glass)
13	Steam autoclave BES-22 L-B-LCD, steam sterilizer GC-10, automatic steam sterilizer with a choice of sterilization modes VKa-75-PZ
14	PCR box, laminar flow machine
15	Luminescent microscope Mikmed-6 option 7 LED,
16	Drying cabinet SH 40
17	bacteriological loops
18	pipettes
19	Laboratory furniture
20	OPn-3.02. Portable batch centrifuge, medical centrifuge SM: SM-50 series
21	Electric stoves –DREAM brands
22	Irradiator-air recirculator UV bactericidal, ultraviolet bactericidal for local irradiation OUPb-04 "Solnyshko"
23	

2. Laboratory of Ecological and Population Genetics (4-24)

№ n/a	Name of the complex, installation, or system
1	PCR box
2	UV Bactericidal Air Recirculator Irradiator

3	Luminescent microscope Mikmed-6 option 7 LED
4	Drying cabinet SHS-40
5	Dry air thermostat ts-1/80