



MINISTRY SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION  
Federal State Autonomous Educational Institution of Higher Education  
**"Far Eastern Federal University"**  
(FEFU)

APPROVED  
FEFU Academic Council  
Extract from the protocol  
dated 03/06/2023 No. 02-23

**BASIC PROFESSIONAL EDUCATIONAL PROGRAM EDUCATIONAL  
PROGRAM OF HIGHER EDUCATION**

DIRECTION OF PREPARATION 06.03.01 Biology

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Bachelor's program "Biomedicine" (in English)»

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Graduate qualification: Bachelor

Full-time form of education

Standard period for completing the program:

Year of start of preparation:

Vladivostok

2023

**APPROVAL SHEET**  
basic professional educational program

The main professional educational program of higher education is compiled in accordance with the requirements of the Federal State Educational Standard 03/06/01 Biology, approved by Order of the Ministry of Education and Science of the Russian Federation dated 08/07/2020 No. 920.

Reviewed and approved at a meeting of the Board of Directors of the Institute of Life Sciences and Biomedicine (School) on December 06, 2022 (Minutes No. 2)

Head of OP VO



signature

V.V. Kumeiko, Director of the  
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## 1. General provisions

The main professional educational program of higher education is a bachelor's degree program implemented by the federal state autonomous educational institution of higher education "Far Eastern Federal University" in the field of study 03/06/01 Biology, is a system of documents developed and approved by the higher education institution taking into account the requirements of the labor market on the basis of educational standard

The focus of OBOP HE is focused on:

- area(s) of professional activity and (or) area(s) of professional activity of graduates on which the program is focused;
- type(s) of tasks and tasks of professional activity of graduates;
- objects of professional activity of graduates or area(s) of knowledge.

Qualification assigned to graduates of the educational program: bachelor.

Educational program is a set of basic characteristics of education (volume, content, planned results) and organizational and pedagogical conditions, which is presented in the form of a curriculum, academic calendar, work programs of academic subjects, courses, disciplines (modules), work programs of practices, state program final certification, collection of funds of assessment and methodological materials, educational work program, calendar plan of educational work.

### 1 Regulatory framework for the development of OBOP HE

The regulatory legal framework for the development of OBOP HE consists of:

- Federal Law of December 29, 2012 No. 273-FZ "On Education in the Russian Federation";
- Federal State Educational Standard of Higher Education;
- professional standards approved by orders of the Ministry of Labor and Social Protection of the Russian Federation;
- order No. 245 dated 04/06/2021 "On approval of the procedure for organizing and implementing educational activities in educational programs of higher education - bachelor's degree programs, specialty programs, master's programs";
- Order of the Ministry of Education and Science of Russia dated November 19, 2013 No. 1258 "On approval of the Procedure for organizing and implementing educational activities in educational programs of higher education - residency programs";
- Order of the Ministry of Education and Science of the Russian Federation dated August 23, 2017 No. 816 "Procedure for the use of e-learning and distance learning technologies by organizations engaged in educational activities in the implementation of educational programs";
- Order of the Ministry of Education and Science of the Russian Federation dated June 29, 2015 No. 636 "On approval of the Procedure for conducting state final

certification for educational programs of higher education - bachelor's degree programs, specialty programs, master's programs”;

- Order of the Ministry of Education and Science of Russia and the Ministry of Education of Russia dated 08/05/2020 No. 885/390 “On practical training of students”;

- order of Rosobrnadzor dated August 14, 2020 No. 831 “On approval of the Requirements for the structure of the official website of an educational organization on the Internet information and telecommunications network and the format for presenting information” (registered with the Ministry of Justice of Russia on November 12, 2020 No. 60867);

- Order of the Ministry of Education and Science of Russia No. 882, Ministry of Education of Russia

No. 391 of 05.08.2020 “On the organization and implementation of educational activities in the network form of implementation of educational programs” (together with the Procedure for the organization and implementation of educational activities in the network form of implementation of educational programs);

- regulatory documents of the Ministry of Science and Higher Education of the Russian Federation (Ministry of Education and Science of the Russian Federation), the Federal Service for Supervision in Education and Science;

- Charter and local regulations and documents of the Far Eastern Federal University.

## 2 Terms, definitions, designations, abbreviations

VO – higher education;

GIA – state final certification;

DET – distance educational technologies;

HIA – limited health capabilities;

GPC – general professional competencies;

OPOP HE is the main professional educational program of higher education;

OS VO FEFU - educational standard of higher education, independently established by FEFU;

GTF – generalized labor function;

PC – professional competencies;

RPD – work program of the discipline (module).

UK – universal competencies;

Federal State Educational Standard for Higher Education is the federal state educational standard of higher education.

## 3 Goals and objectives of the main professional educational program

The educational program “Biomedicine (in English)” has as its goal the development

of students' personal qualities and the formation of general cultural (universal) and professional competencies in accordance with the requirements of the Federal State Educational Standard for Higher Education in the field of preparation 06.03.01 Biology, as well as obtaining a professional profile practice-oriented education that allows you to successfully work in your chosen field of activity, including the training of highly qualified specialists who have comprehensive modern knowledge about the functioning of the human body, about normality and pathology, about the causes of the development of various diseases, ways to prevent and overcome them, who are able to plan and conduct fundamental and applied research in fields of biomedicine, human and animal physiology, immunology and pharmacology.

Program objectives:

- 1) obtaining biological material for laboratory research;
- 2) preparation of biological objects and mastering research methods;
- 3) conducting laboratory biological research according to a given method;
- 4) application of the principles of cellular organization of biological objects, biophysical and biochemical foundations, membrane processes and molecular mechanisms of life;
- 5) analysis of the basic laws of genetics and selection, genomics, proteomics;
- 6) analysis of biochemical, physicochemical, molecular biological mechanisms of the development of pathological processes in the cells and tissues of the human body;
- 7) analysis of obtained laboratory biological information using modern computer technology;
- 8) carrying out work on drug research;
- 9) design of medicines and diagnostic drugs;
- 10) implementation of applied and practical projects to study biochemical, biophysical and physiological processes and phenomena occurring at the cellular, organ and system levels in the human body
- 11) conducting research in a clinical diagnostic laboratory

Types of tasks of professional activity of graduates:

- research;
- design

#### 4 Areas of professional activity

- Education and science (in the areas of: education; scientific research of wildlife; scientific research using biological systems for economic and medical purposes, for nature conservation);
- Healthcare (in the field of development and control of biosafety of new drugs, biomedical research using living organisms and biological systems at various levels of organization); Areas of professional activity and (or) areas of professional activity in which

graduates who have completed a bachelor's degree program (specialist, master's, residency) ), can carry out professional activities.

## 5 Objects of professional activity

Objects of professional activity of graduates or area(s) of knowledge: biological systems of various levels of organization; processes of their life activity and evolution; biological examination and monitoring.

List of professional standards:

– Professional standard "Teacher of additional education for children and adults", approved by order of the Ministry of Labor and Social Protection of the Russian Federation dated May 5, 2018 N 298n (registered by the Ministry of Justice of the Russian Federation on August 28, 2018, registration N 52016)

– Professional standard "Industrial pharmacy specialist in the field of drug research", approved by order of the Ministry of Labor and Social Protection of the Russian Federation dated May 22, 2017 N 432n (registered by the Ministry of Justice of the Russian Federation on July 27, 2017, registration N 47554)

– Professional standard "Industrial pharmacy specialist in the field of quality control of medicines", approved by order of the Ministry of Labor and Social Protection of the Russian Federation dated May 22, 2017 N 431n (registered by the Ministry of Justice of the Russian Federation on July 10, 2017, registration N 47346)

OBOP VO is being implemented:

- on one's own;
- with partial use of distance learning technologies;
- in a foreign language.

## 6 Requirements for the results of mastering OPOP HE

As a result of mastering the OPOP HE, the graduate should develop universal, general professional and professional competencies.

Universal competencies of graduates and indicators of their achievement:

| <b>Category (group) name universalcompetencies</b> | <b>Code and name of universal competence graduate</b>  | <b>Code and name of the achievement indicator universal competence</b>  |
|--|--|---|
| Systemic and critical thinking                     | UK-1 Able to search, critically analyze and synthesize information, apply a systematic approach to solve assigned problems                       | UK-1.1 Searches and collects information using computer technology  |
|  |  | UK-1.2 Applies information products to process and analyze information, following the principles of critical evaluation and verification of sources |
| Development and implementation projects            | UK-2 Is able to determine the range of tasks within the framework of the set goal and choose the best ways to solve them, based on current legal | UK-2.1 Applies tools and methods from various fields of knowledge to solve assigned problems  |
|  |  | UK-2.2 Determines ways to solve a problem within the framework of the goal  |
|  |  | UK-2.3 Selects and analyzes legal norms that are to be  |



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|  | norms, available resources and limitations  | used when solving problems within the framework of the goal<br>UK-2.4 Selects optimal ways to solve problems based on legal requirements<br>UK-2.5 Applies the rules of legal technology when documenting decisions made  |
| Teamwork and Leadership  | UK-3 Able to carry out social interaction and realize his role in the team  | UK-3.1 Uses cooperation strategies to achieve the set goal, defines its role in the team<br>UK-3.2 Takes proactive actions when working in a team<br>UK-3.3 Exchanges information, knowledge and experience with team members<br>UK-3.4 Complies with social norms and established rules of teamwork; bears personal responsibility for the result<br>UK-3.5 Establishes contact and builds relationships with team members based on trust and mutual assistance  |
| Communication  | UK-4 Able to carry out business communication in oral and written forms in the state language of the Russian Federation and foreign language(s) | UK-4.1 Applies information products in business communications to achieve the set goal<br>UK-4.2 Understands the behavioral characteristics of selected groups of people with whom he works/interacts, takes them into account in his professional activities<br>UK-4.3 Competently and effectively builds business oral and written communication with representatives of other nationalities and cultures in foreign languages and the state language of the Russian Federation   |
| Intercultural interaction                                      | UK-5 Able to perceive the intercultural diversity of society in socio-historical, ethical and philosophical contexts                            | UK-5.1 Perceives the intercultural diversity of society and the peculiarities of interaction in it in socio-historical, ethical and philosophical contexts<br>UK-5.2 Understands the diversity of communities in different regions based on knowledge about the features of their development and interaction<br>UK-5.3 Takes into account the characteristics of the cultural diversity of society, key aspects of the development of the Asia-Pacific region<br>UK-5.4 Demonstrates a tolerant perception of social and cultural differences, respectful and careful attitude towards historical heritage and cultural traditions<br>UK-5.5 Finds and uses information necessary for self-development and interaction with other people about the cultural characteristics and traditions of various social groups<br>UK-5.6 Shows in his behavior a respectful attitude towards 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<br>UK-5.7 Consciously chooses value guidelines and civic position; reasonably discusses and solves problems of ideological, social and personal nature |
| Self-organization and self-development (including health care) | UK-6 Able to manage your time, build and implement a trajectory of self-development based on the principles of lifelong education               | UK-6.1 Uses digital tools to organize their work and self-development<br>UK-6.2 Understands and formulates the principles of self-organization and time management<br>UK-6.3 Plans and determines self-development tasks at various stages of personal and professional self-determination  |
|  | UK-7 Able to maintain the proper level of physical fitness to ensure full-fledged social and professional activities                            | UK-7.1 Understands the role of physical culture and sports in modern society, in human life, in preparing him for social and professional activities, the importance of physical education and sports activity in the structure of a healthy lifestyle and the features of planning an optimal motor regimen, taking into account the conditions of future professional activity  |

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|  |  | UK-7.2 Uses self-monitoring techniques to determine the level of health and physical fitness in accordance with regulatory requirements and conditions of future professional activity  |
|  |  | UK-7.3 Maintains an adequate level of physical fitness to ensure full social and professional activities by regularly engaging in physical exercise   |
| Life safety                                    | UK-8 Able to create and maintain safe living conditions in everyday life and professional activities to preserve the natural environment, ensure sustainable development of society, including in the event of the threat and occurrence of emergencies and military conflicts | UK-8.1 Identifies hazardous and harmful factors, predicting the possible consequences of their impact in everyday life, in production activities, in emergency situations, including radiation, chemical and biological contamination |
|  |  | UK-8.2 Offers means and methods for preventing hazards and maintaining safe living conditions to preserve the natural environment and ensure sustainable development of society   |
|  |  | UK-8.3 Develops measures to protect the population and personnel in conditions of danger, including in the event of emergencies and military conflicts  |
|  |  | UK-8.4 Implements methods of health-saving technologies, taking into account the physiological characteristics of the body  |
|  |  | UK-8.5 Has a high sense of patriotism, considers the defense of the Motherland to be his duty and responsibility, fulfills the assigned tasks provided for by the general military regulations  |
| Inclusive competence                           | UK-9 Able to use basic defectological knowledge in the social and professional spheres   | UK-9.1 Applies the principles of non-discriminatory interaction in communication in various spheres of life, taking into account the socio-psychological characteristics of persons with disabilities                                 |
|  |  | UK-9.2 Interacts with persons with limited health capabilities or disabilities in the social and professional spheres   |
|  |  | UK-9.3 Plans and carries out professional activities with persons with disabilities and people with disabilities  |
| Economic culture, including financial literacy | UK-10 Able to make informed economic decisions in various areas of life  | UK-10.1 Predicts the results of personal actions and plans a sequence of steps to achieve a given result of entrepreneurial activity  |
|  |  | UK-10.2 Applies basic economic knowledge to solve problems in various areas of life   |
| civil position                                 | UK-11 Able to form an intolerant attitude towards manifestations of extremism, terrorism, corrupt behavior and counteract them in professional activities  | UK-11.1 Analyzes the current legal norms that ensure the fight against corruption in various areas of life, as well as ways to prevent corruption and create an intolerant attitude towards it  |
|  |  | UK-11.2 Takes part in the planning, organization and conduct of events that ensure the formation of a civic position and the prevention of legal nihilism, including in terms of combating corruption, extremism, terrorism, etc.     |
|  |  | UK-11.3 Complies with the rules of public interaction based on a zero-tolerance attitude towards corruption   |
|  |  | UK-11.4 Understands the need to obtain the basics of military-political and legal training to form a civic position and prevent legal nihilism, including in terms of combating corruption, extremism, terrorism, etc.                |

General professional competencies of graduates and indicators of their achievement:

| Code and name of general professional competencies | Code and name of the general professional achievement indicator |
|--|---|
|--|---|

|  | <b>competencies</b>   |
|--|---|
| OPK-1. Able to apply knowledge of biological diversity and use techniques observation, identification, classification, reproduction and cultivation of living objects for solving professional problems  | GPC-1.1 Applies the theoretical foundations of molecular and cellular biology, microbiology and virology  |
|  | GPC-1.2 Uses the theoretical foundations of molecular and cellular biology to study the properties of living objects, their identification, reproduction and cultivation;   |
|  | OPK-1.3 Applies methods of observation, identification, classification, reproduction and cultivation of living objects to solve professional problems   |
| OPK-2. Able to apply the principles of structural and functional organization, use physiological, cytological, biochemical, biophysical methods of analysis to assess and correct the condition of living objects and monitor their habitat;   | GPC-2.1 Understands the principles of structural and functional organization of biological systems  |
|  | OPK-2.2 Uses physiological, cytological, histological, biochemical, biophysical methods of analysis to assess the condition of living objects and monitor their habitat;  |
|  | OPK-2.3 Analyzes the pharmacokinetics and pharmacodynamics of the studied objects based on knowledge of morphofunctional characteristics, physiological states and pathological processes in the body   |
| OPK-3. Able to apply knowledge of the basics of evolutionary theory, use modern ideas about the structural and functional organization of the genetic program living objects and methods of molecular biology, genetics and developmental biology for research into the mechanisms of ontogenesis and phylogenesis in professional activities; | GPC-3.1 Applies knowledge of the basics of evolutionary theory and analyzes modern directions of evolutionary processes;  |
|  | GPC-3.2 Applies knowledge of the history of development, principles and methodological approaches of general genetics, molecular genetics, population genetics, epigenetics   |
|  | GPC-3.3 Uses modern ideas about the structural and functional organization of the genetic program of living objects;  |
| OPK-4. Capable of implementing measures for protection, use, monitoring and restoration of biological resources, using knowledge of the laws and methods of general and applied ecology;   | GPC-4.1 Applies knowledge of the basics of interaction of organisms with their environment, environmental factors and response mechanisms of organisms, principles of population ecology, community ecology; fundamentals of organization and sustainability of ecosystems and the biosphere as a whole |
|  | OPK-4.2 Implements measures for the protection, use, monitoring and restoration of biological resources;  |
|  | OPK-4.3 Uses knowledge of the laws and methods of general and applied ecology   |
| OPK-5. Able to apply modern concepts in professional activities about the basics of biotechnological and biomedical production, genetic engineering, nanobiotechnology, molecular modeling;  | GPC-5.1 Uses the principles of modern biotechnology, genetic engineering techniques, the basics of nanobiotechnology, molecular modeling in professional activities;  |
|  | OPK-5.2 Evaluates and predicts the prospects of the objects of his professional activity for biotechnological production;   |
|  | GPC-5.3 Applies in professional activities modern ideas about the fundamentals of biotechnological and biomedical production, genetic engineering, nanobiotechnology, molecular modeling  |
| OPK-6. Able to use the basic laws of physics in professional activities, chemistry, earth sciences and biology, apply methods of mathematical analysis and modeling, theoretical and experimental research, acquire new mathematical and natural science knowledge using modern educational and information technologies;                      | GPC-6.1 Uses the basic laws of physics, chemistry, earth sciences and biology in professional activities  |
|  | OPK-6.2 Applies methods of mathematical analysis and modeling, theoretical and experimental research  |
|  | GPC-6.3 Acquires new mathematical and natural science knowledge using modern educational and information technologies   |
| OPK-7. Able to understand the principles of operation of modern information technologies and use them to solve problems of professional activity;  | OPK-7.1 Uses modern IT technologies in collecting, analyzing, processing and presenting natural science information   |
|  | GPC-7.2 Complies with information security standards in professional activities;  |
|  | OPK-7.3 Creates and studies models of real-life natural scientific objects, processes or phenomena  |
| OPK-8. Able to use methods of collecting, processing, organizing and presenting field and laboratory information, apply skills in working with modern equipment,   | OPK-8.1 Formulates conclusions and conclusions based on the results of the analysis of literary data, own experimental and theoretical work in natural sciences   |
|  | OPK-8.2 Offers interpretation of the results of one's own experiments   |

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| analyze the results obtained. | and theoretical calculations using the theoretical foundations of natural sciences                                    |
|                               | OPK-8.3 Systematizes and analyzes the results of experiments, observations, measurements and theoretical calculations |

Professional competencies of graduates and indicators of their achievement:

| Task type | Code and name of professional competence (result of mastery)  | Code and name of the competency achievement indicator  |
|-----------|---|--|
| design    | PC-1 Capable of carrying out fundamental and applied projects to study physiological processes and phenomena occurring at the molecular, cellular, organ and system levels in the human and animal body | PC-1.1 Explores the mechanisms of molecular interaction of cells, tissues and functional systems of organisms, studies the physiological processes occurring in them   |
|           |   | PC-1.2 Uses methods of molecular genetic, cellular and physiological research to study physiological processes in the body   |
|           | PC-2 Applies biotechnology and bioengineering methods for the development and production of medicines, medical devices, biomedical cell products and medical diagnostic systems                         | PC-2.1 Uses fundamental knowledge of molecular and cellular biology to implement genetic and cellular engineering technologies in practice   |
|           |   | PC-2.2 Able to apply genetic and cellular engineering methods for the development and production of medicines, medical devices, biomedical cell products and medical diagnostic systems  |
|           |   | PC-2.3 Able to analyze the results of experiments in the field of biotechnology and bioengineering and carry out the development of medicines, medical devices, biomedical cell products and medical diagnostic systems                |
|           |   | PC-2.4 Capable of transferring the results of research work in the field of biotechnology and bioengineering for the development and production of medicines, medical devices, biomedical cell products and medical diagnostic systems |
|           | PC-3 Capable of conducting experimental studies of biologically active substances and developing  | PC-3.1 Uses knowledge and methods of physiology, biochemistry, molecular and cellular biology to study the properties of biologically active substances  |

|          |  |   |
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|          | medicines and medical devices  | PC-3.2 Able to apply molecular modeling methods for the development of medicines and medical devices  |
|          |  | PC-3.3 Able to develop medicines and medical devices using methods of pharmacological research and pharmaceutical technologies  |
|          |  | PC-3.4 Capable of developing nanosystems for creating medicines and medical devices   |
|          |  | PC-3.5 Capable of conducting preclinical tests of medicines and medical devices   |
| research | PC-4 Able to understand, analyze, and apply the principles of cellular and tissue organization of biological objects, biochemical and molecular biological mechanisms of the development of pathological processes in the cells and tissues of the human body to preserve the health of the population | PC-4.1 Analyzes the biochemical and molecular biological mechanisms of the development of pathological processes in the cells and tissues of the human body and applies the principles of cellular organization of biological objects   |
|          |  | PC-4.2 Understands the biochemical and molecular biological mechanisms of the development of pathological processes in the cells and tissues of the human body  |
|          |  | PC-4.3 Understands and explores the physical processes that underlie the functioning of the body in normal conditions and in pathology, understands the influence of physical factors on the functioning of biological systems, is able to study the physical structure of biologically important molecules in order to identify the relationship between the structure of substances and their biological activity |
|          |  | PC-4.4 Able to develop and apply health-saving technologies   |
|          | PC-5 Able to build mathematical models of physical, chemical and biological processes to solve biomedical problems, possess basic programming skills, use modern methods and resources of bioinformatics and biostatistics   | PC-5.1 Able to build mathematical models of physical processes of living organisms, set parameters and simulate physical problems in common programming languages, including Python   |
|          |  | PC-5.2 Able to build mathematical models of chemical processes to solve biomedical problems, set parameters and carry out modeling of chemical problems in common programming languages, including Python   |
|          |  | PC-5.3 Able to build mathematical models of biological processes, set parameters and carry out modeling of biological problems in common programming languages, including Python  |
|          |  | PC-5.4 Applies modern information technologies and software when solving professional problems  |
|          |  | PC-5.5 Applies modern methods of processing and analysis of scientific and technical information, statistical analysis of biomedical data, including using the R language   |
|          | PC-6 Able to use modern knowledge and methods of genetics, molecular and cellular biology to solve professional problems   | PC-6.1 Uses knowledge and methods of genetics, molecular and cellular biology to study living systems   |
|          |  | PC-6.2 Applies methods of genetics, molecular and cellular biology to identify the mechanisms of pathological processes   |
|          |  | PC-6.3 Able to develop clinical diagnostic systems using knowledge and methods of genetics, molecular and cellular biology  |
|          |  | PC-6.4 Able to perform research in the field of clinical laboratory diagnostics, molecular genetic and cytological studies in order to identify the causes of the disease and make a diagnosis  |

|  |  |   |
|--|--|---|
|  | PC-7 Capable of conducting microbiological, virological and epidemiological studies to solve professional problems in the field of biomedicine | PC-7.1 Has fundamental knowledge of the structure, life activity, classification of microorganisms  |
|  |  | PC-7.2 Applies methods of virological, microbiological and epidemiological analysis   |
|  |  | PC-7.3 Understands the molecular features of the structure of microorganisms, the mechanisms of their interaction with cells and their role in pathological processes |

## 7. Specific features of the BRI

### Relevance:

Biomedicine is a field related to the study of the human body, diseases, and the search for new treatment methods. Due to the fact that the limit of effectiveness of the existing paradigm in medicine has been reached, the development of biomedical research as the technological basis of modern medical science and healthcare is today a key direction of state policy in the field of national well-being.

The relevance of the program is determined by the fact that it is aimed at training personnel to work in globally developing areas such as biomedicine, biotechnology and bioengineering. These scientific areas are at the intersection of several disciplines, improving the use of genetic engineering methods.

The advantages of the program lie in the fundamental general biological training of students and the interdisciplinary approach. The main training courses include General Biology, Developmental Biology, Medical Parasitology, Histology, Physiology with basic anatomy, Pathology with basic nosology, Genetics, Biochemistry, Microbiology, Molecular pharmacology, Mechanisms of normal diseases, Clinical diagnostic methods, Molecular cell biology, Molecular methods and cell biology, Biomedical cell technologies, Cell and tissue engineering, Bioengineering, Genetic engineering, Molecular biotechnology, Medical biotechnology, etc. Particular attention is paid to mathematics, physics, chemistry, computational biology and bioinformatics - disciplines that are extremely important for successful work in the field of knowledge-intensive technologies.

The acquired knowledge, skills and practical skills will open up employment prospects for graduates in biotechnology companies, medical institutions, research institutes and other organizations related to biology and medicine.

### Employment prospects for graduates:

Graduates with a bachelor's degree in biomedicine can occupy the following positions:

- Junior researchers at scientific institutions of the Russian Academy of Sciences and Russian Academy of Medical Sciences in the fields of biomedical chemistry, bioorganic chemistry, cytology, physiology, gene biology, molecular genetics, general genetics, biotechnology, molecular biotechnology, medical biotechnology;
- Biologists and specialists in the field of clinical laboratory diagnostics;
- Bachelors can improve their professional qualifications in a specialized

master's program.

Possible places of employment for a graduate may be: medical clinics, regional clinical center for specialized types of medical care, research institutes such as the Marine Biology Center named after. A.V. Zhirmunsky FEB RAS, Pacific Oceanological Institute FEB RAS, Center for Terrestrial Biota Biodiversity FEB RAS, Pacific Institute of Bioorganic Chemistry FEB RAS, private medical clinics engaged in IVF, modern clinics using cell technologies in reproductive medicine, burn therapy, transfusiology and various areas of transplantology, medical diagnostic centers, research and testing laboratories of industrial enterprises and research and production associations for the production and development of medicines, biomedical cell products

Program partners:

Center for Marine Biology named after. A.V. Zhirmunsky FEB RAS, Pacific Oceanological Institute FEB RAS, Center for Biodiversity of Terrestrial Biota FEB RAS, Pacific Institute of Bioorganic Chemistry FEB RAS, Federal State Budgetary Institution of Science FGBNU Medical Genetic Research Center named after. N.P. Bochkova" (FGBNU "MGSC") of the Ministry of Science and Higher Education of the Russian Federation and the Russian Academy of Sciences (RAN), Federal State Budgetary Institution of Science Institute of Cytology of the Russian Academy of Sciences

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## Structure and content of OBOP VO

### Structure and scope of the undergraduate program

| Program structure |  | Scope of the program and its blocks in z.e. |
|-------------------|--|---|
| Block 1           | Disciplines (modules)  | 198 z.e.                                    |
|                   | Required part:   | 140 z.e.                                    |
|                   | Part of the BRI, formed by participants in educational relations                       | 58 z.e.                                     |
| Block 2           | Practice   | 33 z.e.                                     |
|                   | Mandatory part   | 33 z.e.                                     |
|                   | Part of the BRI, formed by participants in educational relations                       | - z.e.                                      |
| Block 3           | State final certification (in accordance with the Federal State Educational Standard): | 9 z.e.                                      |
|                   | Preparing for and passing the state exam (if available)                                | 3 z.e.                                      |
|                   | Completion and defense of final qualifying work  | 6 z.e.                                      |
| FTD               | Optional disciplines   | 2 z.e.                                      |

OPOP VO ensures the implementation of the discipline in physical culture and sports in the amount of 2 z.e. within the framework of Block 1 “Disciplines (modules)” and the implementation of the discipline “Elective courses in physical education and sports” in the amount of 328 academic hours, which are mandatory for mastering.

The volume of the mandatory part, excluding the volume of the state final certification, is 72.1 percent of the total volume of the program.

#### 9 Features of the organization of the educational process according to the educational program for disabled people and persons with disabilities

FEFU is implementing an organizational model of inclusive education - ensuring equal access to education for all students, taking into account the various special educational needs and individual capabilities of students. The model allows persons with disabilities (hereinafter referred to as persons with disabilities) to use education as the most effective mechanism for personal development and increasing their social status. In order to create conditions for ensuring inclusive education for people with disabilities, FEFU structural units perform the following tasks:

- The Department for work with applicants organizes career guidance among potential applicants, including among persons with disabilities: open days, career guidance testing, webinars for school graduates, vocational education institutions, consultations for this category of students and their parents on admission and training issues, prepares advertising and information materials, organizes interaction with educational organizations;

- schools, together with the Department of Career and Scholarship Programs, provide support for inclusive education of people with disabilities, resolve issues of development and maintenance of the information and technological base of inclusive education, elements of distance learning for people with disabilities, create a barrier-free environment, collect information about people with disabilities, ensure their systematic recording at the stages admission, training, employment;

- the organization for the socialization and adaptation of students with disabilities "KIT" ensures the adaptation of persons with disabilities to the conditions and regime of educational activities, carries out measures to create a socio-cultural tolerant environment necessary for the formation of a civil, legal and professional position of participation, the readiness of all team members to communicate and cooperation, the ability to tolerate social, personal and cultural differences.

The content of higher education in educational programs and the conditions for organizing training for persons with disabilities are determined by an adapted educational program, and for people with disabilities also in accordance with an individual



rehabilitation program, which is developed by the Federal Institute of Medical and Social Expertise. An adapted educational program is developed subject to an application from the student (parents, legal representatives) and medical indications. Training in educational programs for students with disabilities is carried out taking into account the characteristics of psychophysical development, individual capabilities and health status. The choice of teaching methods in each individual case is determined by the goals of training, the content of training, the level of professional training of teachers, methodological and logistical support, the availability of time for preparation, taking into account the characteristics of psychophysical development, individual capabilities and health status of students.

FEFU provides students with disabilities with the opportunity to master specialized adaptive disciplines included in the variable part of the OPOP HE. Teachers whose courses require the performance of certain specific actions that pose a problem or action that is impossible for students with difficulties with movement or speech are required to take these features into account and offer people with disabilities alternative methods of consolidating the material being studied. Timely informing of teachers about persons with disabilities in a particular group is carried out by a responsible person established by order of the director of the FEFU school.

In the reading rooms of the FEFU Scientific Library, workplaces for persons with disabilities are equipped with displays and Braille printers; equipped with portable devices for reading flat-printed texts, scanning and reading machines, a video magnifier with the ability to regulate color spectrums; magnifying electronic magnifiers and ultrasonic markers.

If necessary, individual curricula and individual training schedules can be developed for persons with disabilities. The period for obtaining higher education when studying according to an individual curriculum for persons with disabilities can, if desired, be increased, but not more than by a year.

When sending a student with disabilities to an organization or enterprise to undergo the internship provided for by the curriculum, FEFU agrees with the organization (enterprise) on the conditions and types of work, taking into account the recommendations of the Federal Institution of Medical and Social Expertise and the individual rehabilitation program for the person with disabilities. If necessary, special jobs can be created for internships in accordance with the nature of the violations, as well as taking into account the professional type of activity and the nature of the work performed by students with disabilities.

To carry out ongoing monitoring of progress, intermediate and final certification of persons with disabilities, assessment funds are used, adapted for such students and allowing them to assess their achievement of learning outcomes and the level of development of all competencies stated in the educational program. The form of intermediate and state final certification for persons with disabilities is established taking

into account individual psychophysical characteristics (orally, in writing on paper, in writing on a computer, in the form of testing, etc.).

## 10 Information on staffing of OPOP VO

Personnel support for the implementation of the educational program meets the requirements of the Federal State Educational Standard. Information on staffing for the implementation of OPOP HE is posted on the FEFU website in the section “Information about the educational organization”, subsection “Management. Teaching (research and teaching) staff”, link to website:<https://www.dvfu.ru/sveden/employees/>.

## 12 Information about the availability of the electronic information and educational environment of FEFU

During the entire period of study, the student is provided with individual unlimited access to the electronic information and educational environment of FEFU from any point where there is access to the information and telecommunications network “Internet”, both on the territory of FEFU and outside it. Conditions for the functioning of the electronic information and educational environment can be created using the resources of other organizations.

The FEFU electronic information and educational environment provides:

- access to curricula, work programs of disciplines (modules), practice programs, electronic educational publications and electronic educational resources specified in the work programs of disciplines (modules), practice programs;
- formation of a student’s electronic portfolio, including saving his work and grades for this work.

The electronic information and educational environment of FEFU is additionally provided with recording the progress of the educational process, the results of intermediate certification and the results of mastering the educational program.

Implementation of an educational program using e-learning and distance learning technologies:

- conducting training sessions, procedures for assessing learning outcomes, the implementation of which is provided for using e-learning and distance learning technologies;
- interaction between participants in the educational process, including synchronous and (or) asynchronous, through the information and telecommunications network “Internet”.

The functioning of the electronic information and educational environment is ensured by the appropriate means of information and communication technologies and the qualifications of the workers who use and support it. The functioning of the electronic information and educational environment complies with the legislation of the Russian

Federation.

### 13 Information about material, technical and educational support

The premises are classrooms for conducting training sessions, equipped with equipment and technical means of training, the composition of which is determined in the RPD.

The premises for independent work of students are equipped with computer equipment with the ability to connect to the Internet information and telecommunications network and provide access to the electronic information and educational environment of FEFU.

It is allowed to replace equipment with its virtual analogues.

FEFU is provided with the necessary set of licensed and freely distributed software, including domestically produced ones (the content is determined in the work programs of disciplines (modules) and is subject to updating if necessary).

Information on the logistics of OPOP HE, including information on the availability of equipped classrooms, facilities for conducting practical classes and independent work of students with a list of basic equipment, physical culture and sports facilities, and software, is presented in the RPD.

### 14 Financial conditions for the implementation of the educational program

Financial support for the implementation of the educational program

carried out in an amount not lower than the values of the basic cost standards for the provision of public services for the implementation of educational programs of higher education and the values of correction coefficients to the basic cost standards determined by the Ministry of Science and Higher Education of the Russian Federation.

### 15 Conditions of application of the mechanism for assessing the quality of educational activities and training of students in the educational program

The quality of educational activities and training of students in this program is determined within the framework of a system of internal and external assessment.

In order to improve the educational program, an internal assessment of the quality of educational activities and training of students is carried out with the involvement of employers and their associations. Also, within the framework of the internal system for assessing the quality of educational activities, students are given the opportunity to evaluate the conditions, content, organization and quality of the educational process.

External assessment of the quality of educational activities in an educational program is carried out within the framework of the state accreditation procedure in order to confirm the compliance of educational activities in the OPOP HE with the requirements of the Federal State Educational Standard for Higher Education.

External assessment is carried out within the framework of professional and public accreditation carried out by employers, their associations, as well as organizations authorized by them, including foreign organizations, in order to recognize the quality and level of training of graduates, compliance with the requirements of professional standards (if any), labor market requirements for specialists of the relevant profile.

#### Review (evaluation from employer)

for the main professional educational program of higher education - bachelor's program, 03/06/01 Biology, educational program “Biomedicine (in English)”

OPOP VO was developed by a team of teachers from the Department of Medical Biology and Biotechnology of the Institute of Life Sciences and Biomedicine (School) of FEFU.

OPOP HE is a system of documents developed on the basis of the educational standard of higher education (hereinafter referred to as the Federal State Educational Standard for Higher Education) in the field of preparation 03/06/01 Biology, undergraduate level, approved by order No. 920 dated 08/07/2020.

The peer-reviewed OPOP HE includes: general characteristics; characteristics of the bachelor's professional activity; graduate competencies formed as a result of mastering the OPOP HE; calendar training schedule; syllabus; work programs of disciplines (modules); work programs for practices, methodological materials ensuring the implementation of appropriate educational technology; a list of educational literature necessary for studying disciplines (modules), practices, a program of state final certification, including funds of assessment materials for ongoing monitoring of progress, intermediate and state final certification, and other normative and methodological documents and materials that ensure high quality training students.

OPOP HE regulates the goals, expected results, content, conditions and technologies for implementing the educational process, assessment of the quality of graduate training in this area of training.

The goal of the OPOP is to develop students' personal qualities and form general cultural (universal) and professional competencies in accordance with the requirements of the Federal State Educational Standard for Higher Education in the field of preparation 06.03.01 Biology, as well as to obtain a professional specialized practice-oriented education for the graduate, allowing him to successfully work in his chosen field of activity, including the training of highly qualified specialists with comprehensive modern knowledge about the functioning of the human body, about norm and pathology, about the causes of the development of various diseases, ways to prevent and overcome them, capable of planning and conducting fundamental and applied research in the field of biomedicine, human and animal physiology, immunology and pharmacology.

Program objectives:

- 2) obtaining biological material for laboratory research;
- 2) preparation of biological objects and mastering research methods;
- 3) conducting laboratory biological research according to a given method;
- 4) application of the principles of cellular organization of biological objects, biophysical and biochemical foundations, membrane processes and molecular mechanisms of life;
- 5) analysis of the basic laws of genetics and selection, genomics, proteomics;
- 6) analysis of biochemical, physicochemical, molecular biological mechanisms of the development of pathological processes in the cells and tissues of the human body;
- 7) analysis of obtained laboratory biological information using modern computer technology;
- 8) carrying out work on drug research;
- 9) design of medicines and diagnostic drugs;
- 10) implementation of applied and practical projects to study biochemical, biophysical and physiological processes and phenomena occurring at the cellular, organ and system levels in the human body
- 11) conducting research in a clinical diagnostic laboratory

Bachelors who have mastered this educational program are ready to perform the following types of professional tasks:

- research;
- design

OPOP VO meets the requirements of the Federal State Educational Standard for Higher Education in structure and content. The competence of graduates planned in the OPOP HE meets the employer's requirements for employees of the relevant functions. Graduates can successfully occupy a number of positions:

- Junior researchers at scientific institutions of the Russian Academy of Sciences and Russian Academy of Medical Sciences in the fields of biomedical chemistry, bioorganic chemistry, cytology, physiology, gene biology, molecular genetics, general genetics, biotechnology, molecular biotechnology, medical biotechnology;

- Biologists and specialists in the field of clinical laboratory diagnostics;
- Bachelors can improve their professional qualifications in a specialized master's program.

Possible places of employment for a graduate may be: medical clinics, regional clinical center for specialized types of medical care, research institutes such as the Marine Biology Center named after A.V. Zhirmunsky FEB RAS, Pacific Oceanological Institute FEB RAS, Center for Terrestrial Biota Biodiversity FEB RAS, Pacific Institute of Bioorganic Chemistry FEB RAS, private medical clinics engaged in IVF, modern clinics using cell technologies in reproductive medicine, burn therapy, transfusiology and various

areas of transplantology, medical diagnostic centers, research and testing laboratories of industrial enterprises and research and production associations for the production and development of medicines, biomedical cell products

The quality of the content of the curriculum is beyond doubt. The structure of the curriculum is generally logical and consistent. Evaluation of work programs of disciplines (modules) allows us to conclude that there is a sufficient level of both material and methodological support. The content meets the requirements of the main characteristics of OPOP VO.

#### Conclusion:

Having familiarized ourselves with the description of the graduate's area of professional activity, we are convinced that the types of professional activity of the graduate correspond to the profile of the OPOP, as well as the educational needs of the Far Eastern region in the training of specialists in the field of biomedicine.

The reviewer was presented with documents regulating the content and organization of the educational process during the implementation of the bachelor's degree program: curriculum, calendar academic schedule, work programs of disciplines, funds of assessment tools, internship programs, state assessment program, methodological materials.

The curriculum is developed in accordance with Federal State Educational Standard for Higher Education in the field of training 06.03.01 Biology, undergraduate level, approved by order No. 920 dated 07.08.2020 and adopted as the main document of the learning process. The disciplines of the basic part, the part formed by participants in educational relations, as well as educational and practical training programs are aimed at developing universal, general professional and professional competencies.

The content of the program is regulated by a thematic plan for the presentation of lecture material and practical/laboratory classes of a variety of material in form and content that correspond to the graduate's competency model. Completing independent work is ensured by a sufficient list of educational and methodological materials listed in each program. The content of educational and practical training corresponds to the types of professional activities of the graduate.

We would like to note the availability of normative and methodological documentation for the use of assessment tools for intermediate certification and state final certification. There are assessment tools for assessing all learning outcomes, which allows you to evaluate learning outcomes and the results of mastering the BOP.

Thus, we note the compliance with the peer-reviewed OPOP in the field of study 03/06/01 Biology "Biomedicine (in English)" both to the current level of development of science and technology, and to the basic requirements of the Federal State Educational Standard for Higher Education and professional standards.

Reviewer:

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