

Ministry of Science and Higher Education of the Republic of Kazakhstan  
NJSC «Karaganda University named after Academician E.A.Buketov»

«AGREED»

Director of Quality  
«Karaganda Pharmaceutical Complex» LLP  
Tanaguzova B.M.  
« 4 2023 y.



«APPROVED BY»

Chairman of the Management Board – Rector  
Karaganda University named  
after Academician E.A.Buketov  
N.G. Dulatbekov  
« 05 2023 y.



**EDUCATIONAL PROGRAM**

«7M05102 – Biotechnology»

Level: Magistracy

Karaganda, 2023

**The educational program "7M05102 - Biotechnology" was developed on the basis of:**

- Law of the Republic of Kazakhstan dated July 27, 2007 No. 319-III "On Education"
- Law of the Republic of Kazakhstan No. 151-I of July 11, 1997. "About languages in the Republic of Kazakhstan"
- State mandatory standard of postgraduate education of education dated October 31, 2018 No. 604
- The National Qualifications Framework of March 16, 2016 by the Republican Tripartite Commission on Social Partnership and Regulation of Social and Labor Relations.
- Order of the Ministry of Education and Science of the Republic of Kazakhstan "On approval of the Rules for the organization of the educational process on credit technology" dated October 2, 2018 No. 152
- Classifier of training areas with higher and postgraduate education dated October 13, 2018 No. 569.

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## 1. Passport of the educational program

1. Code and name of the educational program: "7M05102 - Biotechnology"
2. Code and classification of the field of education, areas of training: 7M05 - Natural sciences, mathematics and statistics, 7M051 Biological and related sciences
3. Group of educational programs: "7M082 - Biotechnology"
4. Volume of credits: 120
5. Form of study: full-time
6. Language of instruction: Kazakh, Russian
7. Degree awarded: Master of Natural Sciences in the educational program "7M05102 – Biotechnology"
8. Type of EP: current EP
9. The level of the ISQ: 7
10. The level of the NQF: 7
11. Level according to the IQF: 7
12. Distinctive features of the EP: -
13. Number of the application to the license for the direction of training: KZ83LAA00018495, date of issue 28.07.2020. Appendix 16
14. The name of the accreditation body and the validity period of the EP accreditation: - «ARQA», certificate № HE-SA-000319, date of issue 30.10.2022, validity period 29.12.2027.
15. Purpose of the EP: Training of qualified specialists for the development of economy, industry and culture of the Republic of Kazakhstan, providing conditions for full education, professional competence of specialists-biotechnologists for the production of biotechnological products for various purposes, the development of new biotechnological processes, solutions of practical and theoretical problems of biotechnology in the scientific and practical sphere, teaching.
16. Qualification characteristics of the graduate
  - a) A list of graduate positions: researcher at research institutes and centers of biotechnological profile, process engineer at chemical, food, pharmaceutical enterprises, biotechnologist collector, specialist of environmental protection enterprises, employee of laboratories for quality control and food safety, biochemical laboratories of medical institutions, sanitary and environmental supervision, teacher at universities and colleges.
  - b) The scope and objects of professional activity of the graduate: research institutes, research and production centers of biotechnological, biological, medical, agricultural profile, chemical, food, pharmaceutical enterprises, organizations of sanitary and environmental supervision, organizations engaged in certification and standardization, agricultural complexes, greenhouse fruit and vegetable agricultural plants, universities and colleges.
  - c) Types of professional activity of the graduate:
    - organizational and technological: management and engineering activities, research and engineering and technological developments, analysis and control of compliance with the technology of management of biotechnological production, examination of quality and standardization of products, scientific and organizational activities;
    - production and management: control over production and management activities, biotechnological production management, analysis of the effectiveness of management decisions and standard tasks of the management system in the field of biotechnology;

- project: development and justification of organizational management structures, feasibility study aimed at the development of documentation, introduction of new types of products, sanitary and environmental supervision for compliance with professional standards and regulatory documents;

- research: independent research work, development and participation in research projects, grants, scientific and organizational activities in various fields of biotechnology, scientific cooperation;

- educational: teaching at a university, professional work with students and specialists, deepening professional knowledge with the help of modern information and educational technologies.

d) Functions of the graduate's professional activity:

- participation in the development of state programs in the field of biotechnology;

- implementation of the production of biotechnological products;

- improvement of biotechnological methods and processes to improve the technological characteristics of biotechnological products and increase the efficiency of biotechnological production processes;

- development and provision of quality control management systems for biotechnological products;

- creation of necessary conditions for cultivation and biological realization of biotechnology objects;

- development and implementation of the results of scientific research on biotechnology in production;

- implementation of research and teaching activities in accordance with modern requirements;

- organization of information retrieval work, analysis of research objects in the chosen scientific direction;

- examination of the quality and standardization of biotechnological products;

- control of management and engineering activities at a biotechnological enterprise;

- creation of technical documentation for the development of biotechnological processes.

### Formulation of learning outcomes based on competencies

Type of competencies	Learning result code	Learning result (according to Bloom's taxonomy)
1. Behavioral skills and personal qualities: (Soft skills)	LR 3	Reads, analyzes, referees literature in a foreign language and studies foreign sources. Presents information and scientific research in native and foreign languages.
	LR 9	Uses knowledge of a foreign language in professional and interpersonal communication.
	LR 11	Evaluates the results of his professional activity.
2. Digital competencies: (Digital skills):	LR 13	Introduces and applies technological innovations, digital technologies and scientific developments in the field of food production, biologically active additives, improves existing technologies for analyzing raw materials of biological products and the technological process of products.
	LR 12	Skills to publish the results of scientific research, analyzes the main sources and methods of searching for scientific information.
3. Professional competencies: (Hardskills)	LR 1	Demonstrates knowledge of the history of the formation and development of the philosophical and methodological foundations of science.
	LR 2	Owens modern methods, methodology of research activities in biotechnology.
	LR 4	Presents and substantiates the results of research work using modern research methods and appropriate instruments.
	LR 5	Substantiates the results of scientific research using modern scientific approaches and research methods using new technologies and devices, observes the principles of biological ethics, explores the process of involving the results of scientific research and development in commercial turnover in market segments.
	LR 6	Summarizes the main features of environmental crisis situations, uses professional training to develop biotechnological methods of environmental protection.
	LR 7	Analyzes the patterns of energy relationships between organisms of the biosphere, applies resource- and energy-saving biotechnologies, regulations and standards in the development and implementation of ecobiotechnological projects, requirements for production, standardization, quality control and compliance with the safety of biotechnological products.
	LR 8	Modern ideas in the field of nanotechnology, nanobiobasafety, technologies for the development of medical biological preparations, monoclonal antibodies, diagnostics, vaccines, and the formation of the concept of immunobiotechnology are summarized.
	LR 10	Demonstrates knowledge of fundamental and applied sections of biotechnology. Uses knowledge of modern problems of biotechnology in the field of professional activity.

### Determination of modules of disciplines in accordance with the results of training

Learning result code	Name of the module	Name of disciplines	Volume (ECTS)
LR 1, LR 2, LR 3, LR 5, LR 9, LR 10, LR 11, LR 12, LR 13	Philosophical and historical aspects of social and humanitarian knowledge	History and philosophy of science	4
		Pedagogy of higher education	4
		Management psychology	4
		Pedagogical practice	4
LR 1, LR 3, LR 4, LR 5, LR 9, LR 12, LR 13	Professional languages	Foreign language (professional)	4
		Scientific-research communications	5
		English for STEM Program	
LR 1, LR 2, LR 3, LR 4, LR 5, LR 6, LR 7, LR 8, LR 9, LR 10, LR 11, LR 13	Issues of modern science and technology	Commercialization of scientific and technological activities	5
		Bioenergetics	
		Biotechnological methods of environmental protection	5
		Biological safety standards	
LR 1, LR 2, LR 3, LR 4, LR 5, LR 6, LR 7, LR 9, LR 10, LR 11, LR 12	Molecular genetic foundations of biotechnology	Research methodology in biotechnology	5
		Molecular genetics	5
		Human genome	
LR 2, LR 3, LR 4, LR 5, LR 6, LR 7, LR 8, LR 10, LR 11, LR 12, LR 13	Applied areas of biotechnology	Modern food production biotechnology	5
		Biotechnological methods in production	
		Bioethics	7
		Physiology of microbial resistance	6
		Biomedicine and nanotechnology	
		Probiotics and nutraceuticals	
		Mechanisms of action of hormones	
			Immunobiotechnology
LR 1, LR 2, LR 3, LR 9, LR 12	Scientific research work	Research practice	14
		Scientific research work of a master student, including an internship and a master's thesis (NIRM)	24
	Final attestation	Writing and defending a doctoral dissertation	8

## Matrix of achievability of learning outcomes

NN п/п	Name of disciplines	Brief description of the discipline (30-40 words)	Number of credits	Generated learning outcomes (codes)													
				LR 1	LR 2	LR 3	LR 4	LR 5	LR 6	LR 7	LR 8	LR 9	LR 10	LR 11	LR 12	LR 13	
<b>Cycle of basic disciplines University component</b>																	
D1	History and philosophy of science	It is studied with the aim of forming knowledge about the significance of scientific knowledge in its tendency to development and sociocultural profile. Questions about the philosophy, methodology of science, science as a cognitive activity and tradition are considered.	4	+	+			+					+	+	+	+	+
D2	Pedagogy of higher education	Studied to form ideas about the modern paradigm of higher education and the theory of scientific activity in higher education. The issues of pedagogy, education of professionals-specialists, professional skills of teaching in educational organizations, pedagogical control and evaluation of knowledge in higher education are considered.	4	+				+					+	+	+	+	+
D3	Psychology of Management	It is studied with the aim of forming knowledge about the psychological laws of managerial activity, skills in analysis of socio-psychological principles, the characteristics of the psychology of management, the personal characteristics of the leader.	4	+	+	+		+					+	+	+	+	+
D4	Pedagogical practice	Formation of knowledge about the legal and regulatory framework for the functioning of the higher education system; the order of implementation of the main provisions and documents regulating the activities of the University to improve educational, methodological and scientific work. Analysis of active teaching methods and the use of modern educational technologies in teaching, monitoring and evaluating the effectiveness of educational activities, organization of students' educational activities	4	+		+		+					+	+	+	+	+
D5	Foreign language (professional)	It is studied in order to form the skills of speaking, reading, writing and auditing for effective communication in situations of professional communication, writing texts in a specialty, oral bilateral translation in situations of professional communication.	5	+		+	+	+					+			+	+
D6	Scientific-research	The course is designed to study the mechanisms of promotion of scientific ideas within the scientific	5		+	+	+	+							+	+	



	communications	community and beyond, issues of dissemination of scientific knowledge about the surrounding reality through various forms and institutions of communication. It is studied in order to form knowledge about the actual problems of experimental, design and research activities. Analysis of the laws of the development of the natural environment, society, technology.													
	English for STEM program	The content of the discipline is aimed at improving the competencies of possession of the necessary skills of professional communication in a foreign language and writing, the use of professional English in practice. It is studied in order to form an idea of academic and professional interaction, global trends and practices of STEM technologies. The course is designed to improve skills in professional 3D modeling programs.			+	+	+				+				+
<b>Cycle of basic disciplines</b>															
<b>Component of choice</b>															
D7	Commercialization of the results of scientific and scientific and technical activities	It is studied in order to form skills to use the results of scientific and scientific and technical activities, including the results of intellectual activity in order to withdraw new or improved goods aimed at extracting income to the market.	5	+	+		+	+	+	+	+	+		+	+
	Bioenergetics	The content of the discipline is aimed at the formation of knowledge about the prospects for the development of bioenergy. It is studied in order to form knowledge of current problems of bioenergy and biotechnology, assessment of the energy potential of biomass. The issues of principles and criteria for the production and use of bioenergy, ownership of scientific research and engineering developments to improve the mechanisms of technological support of bioenergy and efficient energy use are considered.			+	+	+	+	+	+	+		+	+	
D8	Biotechnological methods of environmental protection	The content of the discipline is aimed at studying ecobiotechnological methods used in industry, agriculture and everyday life, aimed at protecting the natural environment from pollution and depletion. It is studied in order to form the skills of conducting analyses of technogenic effects on the environment, the use of biotechnological methods in protecting and protecting the environment from pollution by organic substances, mineral salts, waste of the national economy.	5		+		+		+	+	+		+		
	Biological safety standards	The content of the discipline is aimed at studying modern concepts, norms and standards for ensuring biological safety in laboratory conditions. It is studied in order to master the methodologies for the			+		+	+	+	+			+		

		application of quality standards, the principles of certification of research laboratories, the basics of biosafety control when working with biological objects. The use of basic indicators for indexing, assessment methods and principles of risk forecasting.													
<b>Cycle of major disciplines University component</b>															
D9	Research methodology in biotechnology	The course is studied in order to form knowledge about methodological theories and principles, the latest achievements, research directions and practical implementation of biotechnological science. It is intended for studying the analysis of methods of chemical-technological, biochemical and microbiological control of biotechnological processes, the formation of skills of working with devices, means of production control in accordance with technical passports and instructions.	5	+	+	+	+	+	+	+	+		+		
D10	Molecular genetics	It is studied with the aim of imparting knowledge on molecular genetic processes. Methods for obtaining recombinant DNA, problems of gene diagnostics are considered. The course is designed to study basic molecular processes. Determine nucleic acids, compare the structure of molecules. Enclose the results of cloning. Analyze restriction maps. Ability to defend proposed process analysis options.	5		+		+		+	+	+		+	+	+
D11	Human genome	The content of the discipline is aimed at the formation of knowledge about the basic concepts of cytokines and growth factors — regulators of intercellular interaction. It is studied in order to form the skills of analysis and research in the field of human genome. The issues of using modern molecular biological data on the structure and functioning of DNA and RNA, stem cells in scientific research are considered.	5		+	+	+	+	+	+	+		+	+	+
<b>Cycle of major disciplines Component of choice</b>															
D12	Modern food production biotechnology	It is studied in order to form ideas about technological innovations, scientific developments in the field of food production, the creation of food products for general, therapeutic and preventive purposes and special orientation. The issues of compliance with the development trend and state policy in the field of healthy nutrition, the development of technologies for deep processing of food raw materials, radical reduction of food industry waste are considered.	5		+		+	+					+		
	Biotechnological methods	It is studied in order to form knowledge about			+	+	+	+	+	+	+		+	+	+

	in production	modern methods used in the production of biotechnological products and prospects for its development. The issues of analysis of objects, processes and quality criteria of the main production technological processes are considered. The course is designed to study the analysis of the profitability of technological processes, evaluation of the quality of the resulting biotechnological product.														
D13	Bioethics	The content of the discipline is aimed at the formation of moral and ethical principles of human interaction with nature, ideas about the legal aspects of bioethics among undergraduates. It is being studied in order to study the methods of implementing national biosafety measures through national, regional and international partnerships. Application of methods of scientific cognition, ethical standards, increasing the level of knowledge on bioethics.	7		+		+			+	+		+	+	+	+
	Physiology of microbial resistance	It is studied in order to form knowledge about modern studies of the adaptive potential of microorganisms and the mechanisms of its formation. The mechanisms of resistance and adaptation of microorganisms to various environmental conditions, the possibilities of managing the adaptive potential of microorganisms for subsequent practical use in biotechnology, agriculture are considered. Application of methods for studying the biochemical potential of microorganisms on the environment.				+		+	+	+	+	+		+	+	+
D14	Biomedicine and nanotechnology	It is studied in order to form knowledge in the field of nanotechnology, nanomedicine and nanobiotechnology. The course is designed to study the analysis of data on nanomaterials in cell culture technology, the use of nanostructures in biomedicine, modern achievements of nanotechnology in the diagnosis of malignant neoplasms. Knowledge of methods of planning and development of the scheme of biomedical experiments, principles of analysis of nanotechnological developments.	6		+		+	+	+	+	+		+	+		
	Probiotics and nutraceuticals	The content of the discipline is aimed at the formation of knowledge of modern ideas about nutrition, taking into account individual human needs, the use of dietary supplements-nutraceuticals. The course is designed to determine the functional role of dietary supplements-probiotics, to study the ways in which probiotics enter the human body. Analysis of control documentation, differentiated assessment of the quality, safety and effectiveness of dietary supplements.				+		+			+	+			+	

D15	Mechanisms of action of hormones	The content of the discipline is aimed at the formation of knowledge about the general principles of biosynthesis and secretion of hormones, the main types of membrane receptors, the kinetics of formation and decay of hormone-receptor complexes. The course is designed to apply the acquired knowledge in practice to solve actual practical problems in the field of biochemistry and physiology, conducting experiments using laboratory equipment and instruments.	6		+	+	+	+		+	+		+	+		
	Immunobiotechnology	The content of the discipline is aimed at studying the mechanisms of immunoregulation of biotechnological production, technologies and methods for studying the functions of the human immune system. It is studied in order to master the principles of the organization of quality control of biological products, the use of bioengineering methods and modern biotechnology based on the production of diagnostic and medicinal products.					+	+		+	+					+
D16	Research practice	The purpose of the research practice is to study the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as to consolidate practical skills in applying modern methods of scientific research, processing and interpretation of experimental data in dissertation research.	14	+	+	+						+				+

## Coordination of the planned learning outcomes with the methods of teaching and evaluation within the module

Learning outcomes	Planned learning outcomes for the module	Teaching methods	Assessment methods
LR1	Demonstrates knowledge of the history of the formation and development of the philosophical and methodological foundations of science.	round table	preparation of the presentation
LR2	Owns modern methods, methodology of research activities in biotechnology.	interactive lecture	testing
LR 3	Reads, analyzes, referees literature in a foreign language and studies foreign sources. Presents information and scientific research in native and foreign languages.	business game	preparation of the presentation
LR 4	Presents and substantiates the results of research work using modern research methods and appropriate instruments.	case study method	project preparation
LR 5	Substantiates the results of scientific research using modern scientific approaches and research methods using new technologies and devices, observes the principles of biological ethics, explores the process of involving the results of scientific research and development in commercial turnover in market segments.	method of projects	preparation of the presentation
LR 6	Summarizes the main features of environmental crisis situations, uses professional training to develop biotechnological methods of environmental protection.	interactive lecture	testing
LR 7	Analyzes the patterns of energy relationships between organisms of the biosphere, applies resource- and energy-saving biotechnologies, regulations and standards in the development and implementation of ecobiotechnological projects, requirements for production, standardization, quality control and compliance with the safety of biotechnological products.	method of analysis of specific situations	project preparation
LR 8	Modern ideas in the field of nanotechnology, nanobiobasafety, technologies for the development of medical biological preparations, monoclonal antibodies, diagnostics, vaccines, and the formation of the concept of immunobiotechnology are summarized.	discussion	project preparation
LR 9	Uses knowledge of a foreign language in professional and interpersonal communication.	research method	participation in the colloquium
LR 10	Demonstrates knowledge of fundamental and applied sections of biotechnology. Uses knowledge of modern problems of biotechnology in the field of professional activity.	interactive lecture	conducting a colloquium
LR 11	Evaluates the results of his professional activity.	project training	preparation of the presentation
LR 12	Skills to publish the results of scientific research, analyzes the main sources and methods of searching for scientific information.	project training	writing an essay
LR 13	Introduces and applies technological innovations, digital technologies and scientific developments in the field of food production, biologically active additives, improves existing technologies for analyzing raw materials of biological products and the technological process of products.	round table	preparation of a scientific article

## Criteria for assessing the achievability of learning outcomes

Codes of LO	Criteria
LO 1	<b>Knows:</b> the history of the formation and development of the philosophical and methodological foundations of science
	<b>Can:</b> to analyze the mechanisms of functioning of science
LO 2	<b>Knows:</b> the latest theoretical, methodological and technological achievements of domestic and foreign science in the field of biotechnology
	<b>Owens:</b> modern methods, methodology of research activities in biotechnology
LO 3	<b>Can:</b> analyze, review literature in a foreign language, publicly present information about scientific research in a foreign language
	<b>Owens:</b> skills of professional communication in a foreign language and writing
LO 4	<b>Knows:</b> modern technologies of information collection, processing and interpretation of experimental and empirical data obtained
	<b>Can:</b> professionally present and justify the results of research work using modern research methods and appropriate devices
	<b>Owens:</b> skills of working with instruments and methods of analysis of research results
LO 5	<b>Knows:</b> principles of biological ethics in conducting research
	<b>Can:</b> substantiate the results of research work using modern scientific approaches and research methods with the use of new technologies and devices
	<b>Owens:</b> methods of introducing the results of scientific research and development into commercial circulation in market segments
LO 6	<b>Knows:</b> the main types and concepts of environmental crisis situations
	<b>Can:</b> use professional training to develop biotechnological methods of environmental protection
LO 7	<b>Knows:</b> regularities of energy interrelations between organisms of the biosphere
	<b>Can:</b> apply resource- and energy-saving biotechnologies, regulations and standards in the development and implementation of ecobiotechnological projects
	<b>Owens:</b> the basic rules and requirements for the production, standardization, quality control and compliance with the safety of biotechnological products
LO 8	<b>Knows:</b> the main directions of nanotechnology, immunobiotechnology and biomedicine, medical applications of molecular nanotechnology
	<b>Can:</b> analyze the documentation on nanobiobsecurity and control of the use of nanotechnology
	<b>Owens:</b> technologies for the development of medical biologics, monoclonal antibodies, diagnostics, vaccines
LO 9	<b>Knows:</b> language tools for constructing statements and texts in accordance with the norms of language and speech forms
	<b>Can:</b> to use knowledge of a foreign language in professional and interpersonal communication
LO 10	<b>Knows:</b> fundamental and applied sections of biotechnology
	<b>Can:</b> analyze methods of chemical-technological, biochemical and microbiological control of biotechnological processes
	<b>Owens:</b> skills of working with devices, production controls in accordance with technical data sheets and instructions
LO 11	<b>Knows:</b> modern biotechnological methods in production and prospects for its development
	<b>Can:</b> analyze the main objects and areas of application of biotechnology, large-scale industrial biotechnological productions
	<b>Owens:</b> methods of working with biological objects and equipment of biotechnological processes
LO 12	<b>Knows:</b> the main sources and methods of scientific information search
	<b>Owens:</b> skills of publishing the results of scientific research
LO 13	<b>Knows:</b> current technologies for the analysis of raw materials of biological products and the technological process of products
	<b>Owens:</b> technological innovations, digital technologies and scientific developments in the field of biotechnology

## Graduate Model EP «7M05102 – Biotechnology»

### Graduate Attributes:

- Deep professional knowledge in their field of study
- Interest in mastering trends in education and science
- Ability to collaborate in the professional community
- Independence in the search for opportunities for professional and personal development
- Communication skills
- Tolerance and good manners
- Academic integrity
- Willingness to participate in solving state tasks and strategies of Kazakhstan

Types of competencies	Description of competencies
1. Behavioral skills and personal qualities (Softskills)	Ability to critical thinking, analysis, independent organization of their professional activities. The ability to quickly solve tasks, act in non-standard situations, take responsibility for yourself. The ability to independently develop, define and solve problems of professional and personal development, engage in self-education. Knowledge of work ethics, discipline, sense of responsibility, ability to work in a team.
2. Digital competencies (Digital skills):	The ability to develop and use information and communication technologies in professional activities, to have awareness of the basic technologies of digital learning. The ability to analyze the principles, prospects for the development of biological science and substantiate scientific approaches using digital technologies Ability to master the generally accepted language of international communication in the digital environment, knowledge about information security in the field of blockchain technology application
3. Professional competencies (Hardskills)	Ability to develop, implement and apply innovative technologies, modern methodological approaches of scientific research in the field of biology The need to present and substantiate the results of research work using modern research methods and equipment The ability to use promising digital developments in professional activity, to substantiate scientific approaches to the use of digital technologies in professional practice The ability to navigate scientometric databases, carry out peer review and expert evaluation of research activities, present research results in the form of a scientific report, article, report, dissertation, professional conduct of scientific discussions The ability to defend their position on modern problems of biology and compliance with biological safety, to justify and develop plans for the use of alternative technology to solve biological problems. The ability to determine scientific approaches to the development of practical recommendations and modern research methods for the conservation of biodiversity, to develop programs for the safe operation of hazardous production facilities, to manage technological processes The ability to justify, implement and implement technological processes of production, apply modern methods of processing, analysis and synthesis of biological information in production

**Developers:**

Members of the working group:

Head of the Department of Physiology, Candidate of Biological Sciences, assistant professor

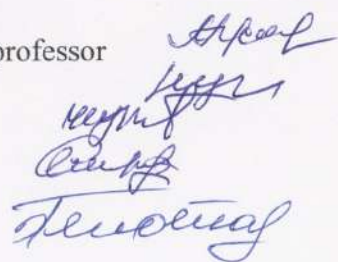
Candidate of Medical Sciences, Associate Professor

Doctor of Philosophy PhD, Associate Professor

Master's student of 2 year of study

Employer:

Director of Quality «Karaganda Pharmaceutical Complex» LLP



G.Zh. Mukasheva

Sh.M. Nugumanova

K.A. Nurlybaeva

O.B. Olzhabai

B.M. Tanaguzova

The educational program was reviewed by the Faculty Council from 07.04.2023 protocol № 9

The educational program was reviewed at the meeting of the Academic Council from 28.04.2023 protocol № 5

The educational program was reviewed and approved at the meeting of the University Board from 30.05.2023 protocol № 12

**Member of the Board – Vice-rector for academic affairs**

**Acting Director of the Academic Work Department**

**Dean of the Faculty of Biology and Geography**



T.Z. Zhussipbek

S. A. Smailova

S.A. Talzhanov



## EDUCATIONAL PROGRAM DEVELOPMENT PLAN

### 7M05102-Biotechnology

The purpose of the Plan is to contribute to improving the quality of the conditions for the implementation of the educational program, taking into account the current requirements of the labor market and the achievements of modern science.

#### Target indicators

№	Indicators	Unit of measurement	2022-2023	2023-2024	2024-2025	2025-2026
<b>1</b>	<b>Human resources development</b>					
1.1	Increase in the number of teachers with academic degrees	Number of people	-	1	1	2
1.2	Advanced training in the teaching profile	Number of people	4	2	2	3
1.3	Involvement of practitioners in teaching	Number of people	1	1	1	2
<b>2</b>	<b>Promotion of the EP in the ratings</b>					
2.1	IQAA	Position	5	4	3	3
2.2	IAAR	Position	3	3	2	2
<b>3.</b>	<b>Development of educational and scientific-methodical literature, electronic resources</b>					
3.1	Textbooks	Number	-	-	1	-
3.2	Training manuals	Number	-	1	-	-
3.3	Methodological recommendations/instructions	Number	1	-	-	1
3.4	Electronic textbook	Number	-	1	1	-
3.5	Video/audio lectures	Number	3	2	3	4
<b>4.</b>	<b>Development of educational and laboratory facilities</b>	Number				
4.1	Purchase of software products	Number	1	1	1	1
4.2	Purchase of equipment	Number	1	1	1	1
<b>5.</b>	<b>Updating the content of the EP</b>					
5.1	Updating the learning outcomes and the list of disciplines taking into account the requirements of the labor market, scientific achievements, professional standards	Year	-	-	+	-
5.2	Introduction to the EP of academic disciplines in foreign languages	Year	-	-	-	+
5.3	Introduction of new teaching methods	Year	+	+	+	+

Head of the Department of Physiology



G.Zh. Mukasheva