


MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE REPUBLIC OF KAZAKHSTAN

KARAGANDA UNIVERSITY NAMED AFTER ACADEMICIAN E.A. BUKETOV



«AGREED»


Director of the Nazarbayev Intellectual School of Chemistry and  
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« 21 » 04 2023.



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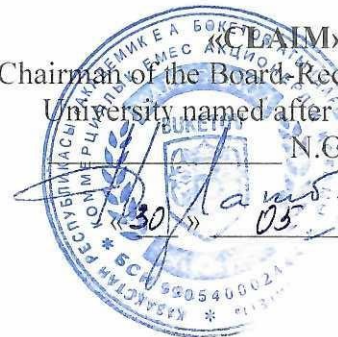
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Chairman of the Board - Rector of Karaganda  
University named after E.A. Buketov  
N.O. Dulatbekov

  
« 30 » 05 2023.

EDUCATIONAL PROGRAM in

the field of training «7M015-teacher training in natural science subjects»

«7M01505 – Biology»

**The educational program "«7M01505- Biology » is developed on the basis of:**

- Law of the Republic of Kazakhstan dated July 27, 2007 № 319-III "on education"
  - Law of the Republic of Kazakhstan dated July 11, 1997 № 151-I. "On languages in the Republic of Kazakhstan - State mandatory standard of postgraduate education № 604 dated August 31, 2018 "
  - National qualifications framework of March 16, 2016 by the Republican tripartite Commission on social partnership and regulation of social and labor relations.
  - Order of MES of RK "On approval of Rules of organization of educational process on credit technology" from October 2, 2018 №152  
The classifier of areas of education and training with higher and postgraduate education of October 13, 2018. №569.
  - Order of the Minister of Education and Science of the Republic of Kazakhstan dated May 10, 2018 No. 199 "On Amendments and Additions to the Order of the Minister of Education and Science of the Republic of Kazakhstan dated April 3, 2013 No. 115 "On Approval of standard curricula in general education subjects, elective courses and electives for general education organizations".
- For pedagogical specialties:
- State mandatory standard of primary education. Approved by the decree of the Government of the Republic of Kazakhstan dated August 23, 2012 №1080. Resolution of the Government of the Republic of Kazakhstan dated August 15, 2017 №484.
  - Professional standard "Teacher "(Appendix to the order of the Chairman of the Board of the National chamber of entrepreneurs of the Republic of Kazakhstan "Atameken" dated June 8, 2017 №133).
- For other majors:
- Professional standard " national qualifications framework (2016) "(approved by the Protocol of the Republican tripartite Commission on social partnership and regulation of social and labor relations within the framework of national qualifications dated March 16, 2016)
  - Industry qualifications framework " industry qualifications framework in the field of education "(approved by the minutes of the meeting of the industry tripartite Commission on social partnership and regulation of social and labor relations under the Ministry of education and science of the Republic of Kazakhstan dated November 23, 2016 No. 2).
- By the decision of the Academic Council of the University of 2021 "01" september since the beginning of the year, it was proposed to put into effect.

## Content

| <b>№</b> | <b>Section names</b>  | <b>Page</b> |
|----------|---|-------------|
| 1.       | Form 1. Passport of the educational program   | 4           |
| 2.       | Form 2. Formulation of learning outcomes based on competencies  | 7           |
| 3.       | Form 3. Определение модулей дисциплин и соответствие результатам обучения   | 8           |
| 4.       | Form 4. Matrix of achievability of learning outcomes  | 9           |
| 5.       | Form 6. Coordination of the planned learning outcomes with the methods of teaching and evaluation within the module | 13          |
| 6.       | Form 7. Criteria for assessing the achievability of learning outcomes   | 14          |
| 7.       | Form 8. The graduate model of the educational program   | 16          |

## Passport of the educational program

|    | Name of the parameter   | Description   |
|----|---|---|
| 1  | <b>Code and name of the educational program:</b>  | «7M01505 – Biology»   |
| 2  | <b>Code and classification of the field of education, areas of training:</b>                      | 7M01 – Pedagogical sciences, 7M015 – Teacher training in natural science subjects   |
| 3  | <b>Group of educational programs:</b>   | M014- Training of biology teachers  |
| 4  | <b>Volume of loans:</b>   | 120 ECTS  |
| 5  | <b>Form of training:</b>  | full - time   |
| 6  | <b>Language of instruction:</b>   | Kazakh, Russian, English  |
| 7  | <b>Degree awarded:</b>  | Master of Pedagogical Sciences in the educational program "7M01505-Biology"   |
| 8  | <b>Type of EP:</b>  | current   |
| 9  | <b>Level according to ISCE</b>  | – Level 7;  |
| 10 | <b>Level according to NQF</b>   | – Level 7;  |
| 11 | <b>Level according to IQF</b>   | – Level 7;  |
| 12 | <b>Distinctive features of OP:</b>  | none  |
|    | Partner University (JEP)  |   |
|    | Partner University (TDEP)   |   |
| 13 | <b>Appendix number to the license for the direction of training:</b>                              | KZ83LAA00018495 dated 07/28/2020, No. 16  |
| 14 | <b>The name of the accreditation body and the validity period of the accreditation of the EP:</b> | Independent Agency for Quality Assurance in Education (IQAA) (Certificate of International accreditation of educational programs SA-A No.0193/1 dated November 09, 2020; certificate validity period November 09, 2020 – November 08, 2027) |
| 15 | <b>Educational program purposes</b>   | Training of highly qualified specialists with research and pedagogical competencies in the field of biology and teaching methods for the implementation of professional activities in the field of secondary and higher education.          |
| 16 | <b>Qualification characteristics of the graduate</b><br>a) List of graduate positions             | - teacher, specialist and laboratory assistant at universities, engineer, laboratory assistant at research institutes, sanitary and epidemiological stations;<br>- biology teacher in secondary schools, gymnasiums, colleges;              |

|  |   |   |
|--|---|---|
|  | <p>b) The sphere and objects of professional activity</p> <p>c) Types of professional activity</p> <p>d) Functions of professional activity</p> | <ul style="list-style-type: none"> <li>- specialist in yunnat stations, nature museums;</li> <li>- specialist in state management organizations, education departments, akimats and other institutions.</li> </ul> <p>The sphere of professional activity of graduates is the field of theoretical and practical methods of teaching biology</p> <p>The objects of professional activity of masters under the educational program "7M01505-Biology" are:<br/>higher educational institutions of medical and biological profiles, secondary and secondary specialized educational organizations, research organizations of various profiles requiring higher postgraduate education in accordance with the legislation of the Republic of Kazakhstan.</p> <ul style="list-style-type: none"> <li>a) educational (pedagogical): work as a biology teacher in various educational institutions (universities, schools, gymnasiums, lyceums, colleges, etc.), including teaching disciplines in English;</li> <li>b) research: performing scientific research in specialized disciplines in various organizations (botany, zoology, anatomy, physiology, biochemistry, genetics, etc.);</li> <li>c) project: implementation of general and specialized developments in design and engineering organizations (landscaping, watering, reconstruction, planning, for example, agrobiostations, yunnat stations);</li> <li>d) expert consulting;</li> <li>e) organizational and managerial</li> </ul> <ul style="list-style-type: none"> <li>- educational (the correct application of the acquired knowledge in the pedagogical process, planning and conducting practical work in biology, improving methods and technologies of teaching biology);</li> <li>- educating (the implementation of the upbringing of the younger generation in the context of the development of the national idea "Mangilik el", ensuring the unity of education and upbringing,</li> </ul> |
|--|---|---|

|  |  |   |
|--|--|---|
|  |  | <p>cultural and educational, sanitary and hygienic work among students);</p> <ul style="list-style-type: none"><li>- methodological (organization and development of one's own pedagogical activity, expansion of skills in handling modern technology and the use of information technologies in the field of professional activity, planning, implementation, analysis of the results of pedagogical tasks in educational institutions, research, analysis and release of educational literature in the field of biology and methods of teaching biology);</li><li>- research (conducting research on current areas of biology and teaching methods);</li><li>- social and communicative (constant self-improvement and self-development through the use of reflexive techniques for professional and personal growth, maintaining the need and skills of independent creative mastery of new knowledge).</li></ul> |
|--|--|---|



## Formulation of learning outcomes based on competencies

| Type of competencies                                      | Learning result code | Learning outcomes (according to Bloom's taxonomy)   |
|---|----------------------|---|
| 1. Behavioral skills and personal qualities (Soft skills) | LO1                  | Demonstrates stable knowledge and skills in the field of philosophy, pedagogy and psychology, in the practice of his own research.  |
|   | LO2                  | Applies a set of knowledge, skills and abilities for independent in-depth development of modern educational pedagogical technologies in the field of biology.   |
|   | LO3                  | Possesses the skills and abilities of independent effective creative and research activities; offers options for commercialization of the results of his scientific work.   |
|   | LO4                  | Collects and interprets information to fulfill its own research concept, followed by the development of ways to use the results of scientific activity in practice.   |
| 2. Digital competencies (Digital skills)                  | LO5                  | Expands the list of modern IT technologies used for conducting training sessions and educational process activities in their professional activities.   |
|   | LO6                  | Develops new ways of using ICT to enrich the learning environment and increase the motivation of students.  |
| 3. Professional competencies (Hard skills)                | LO7                  | Analyzes the molecular mechanisms of biological processes; selects informative experimental methods of working with biological objects in field and laboratory conditions using modern equipment.                             |
|   | LO8                  | Offers solutions to current problems in the field of scientific evolutionary biology; explains the role of animals in ecosystems.   |
|   | LO9                  | Evaluates the possibilities of practical implementation of the theoretical provisions of chronobiology and evolutionary biology; develops approaches to research activities based on modern value concepts of nature.         |
|   | LO10                 | Differentiates the main methods of teaching biology, selects innovative pedagogical technologies implemented in higher education and secondary specialized educational institutions for use in their professional activities. |
|   | LO11                 | Explains the nuances of using biological terminology in English in professional communication.  |
|   | LO12                 | Deepens knowledge and expands the scope of skills in the field of theoretical and practical science for the successful assimilation of modern scientific achievements in various branches of biology.                         |

Definition of discipline modules and compliance with learning outcomes

| Learning result code                                    | Name of the module  | Name of disciplines   | Volume (ECTS) |
|---|---|---|---------------|
| LO1<br>LO2<br>LO4                                       | Philosophical and historical aspects of social and humanitarian knowledge | History and philosophy of science   | 4             |
|   |   | Higher school pedagogy  | 4             |
|   |   | Psychology of management  | 4             |
|   |   | Pedagogical practice  | 4             |
| LO5<br>LO6<br>LO11<br>LO12                              | Professional languages  | Foreign language (professional)   | 4             |
|   |   | Theory and practice of Biological education (in English)                              | 5             |
|   |   | Teaching biology in a foreign language  |               |
| LO3<br>LO4  | Issues of modern science and technology                                   | Commercialization of the results of scientific and scientific-technical activities    | 5             |
|   |   | Introduction of scientific research in education into practice                        |               |
|   |   | Innovation in biology   | 5             |
|   |   | Modern applied methods in biology   |               |
| LO7<br>LO12   | Theoretical and practical aspects of biology                              | Theoretical biology   | 5             |
|   |   | Cell Biology  | 5             |
|   |   | Modern aspects of physiology  | 4             |
| LO5<br>LO6<br>LO7<br>LO8<br>LO9<br>LO10<br>LO11<br>LO12 | Theoretical and applied biology   | Teaching biology in a modern school   | 5             |
|   |   | Modern problems of biology teaching methods   |               |
|   |   | STEAM technologies in the modern educational space                                    | 6             |
|   |   | Conceptual Biology Training   |               |
|   |   | Chronobiology   | 5             |
|   |   | Cyclic processes in biological systems  |               |
|   |   | Evolution and the animal system   | 4             |
|   |   | Phylogeny of the animal world   |               |
|   | Experimental studies in zoology   | 5   |               |
|   | Zoological methods of studying ecosystem dynamics                         |   |               |
|   | Research practice   | 14  |               |
| LO6<br>LO7<br>LO8<br>LO9<br>LO10<br>LO11<br>LO12        | Final certification   | Preparation and defense of a master's thesis  | 8             |
|   |   | Undergraduate research work, including internships and the implementation of a master |               |



## Matrix of achievability of learning outcomes

| NN<br>π/π | Name of disciplines                                      | Brief description of the discipline<br>(30-40 words)   | Number<br>of credits | Generated learning outcomes (codes) |     |     |     |     |     |     |     |     |      |      |      |   |
|-----------|--|--|----------------------|-------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|---|
|           |  |  |                      | LO1                                 | LO2 | LO3 | LO4 | LO5 | LO6 | LO7 | LO8 | LO9 | LO10 | LO11 | LO12 |   |
|           |  | <b>Cycle of basic disciplines<br/>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                    | +                                   | +   |     |     |     |     |     |     |     |      |      |      |   |
|           | Pedagogical practice                                     | Methodology of conducting independent research and scientific and pedagogical activities that require a broad multidisciplinary education. Development and conduct of lectures, practical classes in the disciplines. Development of tasks for independent work of students, SROP. Methods of educational work with students.  | 4                    | +                                   | +   |     |     |     |     |     |     |     |      |      |      |   |
| D4        | Foreign language (professional)                          | The course is taken for developing the skills and abilities of foreign language speech activity in the subject area for effective communication in situations of professional interaction. The course is designed to teach how to work with specialized literature, to practice of oral and written bilingual translation. There are considered the issues of a foreign language for specific purposes and norms of professional speech. | 4                    |                                     |     |     |     |     |     |     |     |     |      |      |      | + |
|           |  | <b>Cycle of basic disciplines<br/>Component of choice</b>  |                      |                                     |     |     |     |     |     |     |     |     |      |      |      |   |
| D5        | Theory and practice of biological education (in English) | It is studied in order to form the skills of teaching natural science subjects in English. The issues of education and upbringing are considered taking into account the requirements of the modern multicultural world. The course is designed to study multilingualism in the educational process as   | 5                    |                                     |     |     |     |     | +   | +   |     |     |      |      |      | + |

|    |  |   |   |  |  |  |  |  |   |   |   |  |  |  |  |  |  |  |  |   |
|----|--|---|---|--|--|--|--|--|---|---|---|--|--|--|--|--|--|--|--|---|
|    |  | the basis for the formation of a multicultural personality among the youth of Kazakhstan.   |   |  |  |  |  |  |   |   |   |  |  |  |  |  |  |  |  |   |
|    | Teaching biology in a foreign language   | It is studied in order to form the skills of teaching biological disciplines in English, as well as to provide conditions for creative self-realization and expansion of the vocabulary of the English language among students. The course is designed to study theoretical knowledge about the basic concepts in biology in English and methodological approaches in teaching biology in a foreign language.   |   |  |  |  |  |  | + | + |   |  |  |  |  |  |  |  |  |   |
| D6 | Commercialization of the results of scientific and scientific-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 |  |  |  |  |  | + | + |   |  |  |  |  |  |  |  |  |   |
|    | Introduction of scientific research in education into practice                     | It is studied in order to form the skills of introducing the results of scientific research into pedagogical activity. The issues of specificity and complexity of the implementation of the results of scientific and pedagogical research into practice, criteria for the degree of effectiveness of pedagogical experience and research, as well as mechanisms for the introduction of scientific research into practice in education: domestic and foreign experience are considered. |   |  |  |  |  |  |   | + | + |  |  |  |  |  |  |  |  |   |
| D7 | Innovation in biology  | It is studied in order to form knowledge about innovative discoveries in biology and medicine, their impact on the modern level of science development. The historical prerequisites for innovation, the experience of innovation activity, the role of innovation in the life of society, the analysis of the current level of innovation activity in biological research are considered.  | 5 |  |  |  |  |  |   | + |   |  |  |  |  |  |  |  |  |   |
|    | Modern applied methods in biology  | It is studied in order to form knowledge about modern applied methods in biology. Scientific research, private and special methods of scientific research in biology, the use of methods of scientific cognition, research behavior, methodology of scientific creativity, varieties of scientific style of speech, methods of experimental research, statistical processing of experimental results are considered.  |   |  |  |  |  |  |   |   | + |  |  |  |  |  |  |  |  |   |
|    |  | <b>Cycle of specialized disciplines<br/>University component</b>  |   |  |  |  |  |  |   |   |   |  |  |  |  |  |  |  |  |   |
| D8 | Theoretical biology  | It is studied in order to form ideas about the general theory of systems, about the fundamental physical principle of stable disequilibrium, the main directions of development of theoretical biology, the fundamental principles of the phenomenon of life. The course is designed to study the basic research that laid the foundations of theoretical biology.  | 5 |  |  |  |  |  |   |   |   |  |  |  |  |  |  |  |  | + |
| D9 | Cell Biology   | It is studied in order to form knowledge about the features of the structure and functions of the cell nucleus and organelles, the functioning and molecular aspects of the vital activity of cells as elementary units of living nature. General questions of cell biology, structural and functional  | 5 |  |  |  |  |  |   |   |   |  |  |  |  |  |  |  |  | + |

|   |   |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |
|---|---|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|---|---|---|
|   |   | characteristics of all subcellular structures and complexes, as well as stages and features of cell reproduction mechanisms are considered.  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |
| D10   | Modern aspects of physiology                      | The content of the discipline is aimed at studying the methods used in physiology. It is studied in order to form ideas about the role of physiology in the development of biological knowledge, the connection of physiology with other sciences, as well as knowledge about cytophysiology, physiology of the nervous, motor, circulatory, respiratory, digestive and endocrine systems.   | 4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | + |   |   |   |
| <b>Cycle of specialized disciplines<br/>Component of choice</b> |   |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |
| D11   | Teaching biology in a modern school               | It is studied in order to form knowledge about teaching technologies, their diversity and classification, the features of application in modern schools, as well as the formation of ideas about the semantic search activity of a specialist in the design of teaching technology. The issues of modern traditional education, technology of problem-based learning, modular learning, information and communication technologies are considered. | 5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   | + |   |   |
|   | Modern problems of biology teaching methods       | It is studied in order to form the skills of a competence-based approach in teaching and universal educational achievements of students in biology. Modern forms and methods of biology teaching organization are considered. The course is designed to study the features of modern biological education and methods of teaching biology.   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   | + |   |
| D12   | STEM technologies in the modern educational space | It is studied in order to form skills of using STEM technologies in secondary school, project and case technologies in STEM education. The methods of evaluating the effectiveness of STEM education are considered. The course is designed to study the stages of the emergence of STEM technologies and the development of STEM education in the Republic of Kazakhstan at the present stage.  | 6 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   | + |   |
|   | Conceptual Biology Training                       | It is studied in order to form ideas about conceptual learning and in integration with traditional methods and means of teaching biology. The issues of analyzing the intensity of learning, taking into account modern achievements in the natural sciences, using the latest data as a resource for motivating students to study biology are considered.   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   | + |
| D13   | Chronobiology                                     | It is studied in order to form knowledge about the adaptive role of diurnal and seasonal rhythms, ideas about the basic concepts of chronobiology, types and structure of biological rhythms and applied research methods. Chronobiological aspects of adaptation, cosmic rhythms in cultural phenomena, social phenomena, history, economy are considered.  | 5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   | + |
|   | Cyclic processes in biological systems            | It is studied in order to form knowledge about the regulators of circadian biorhythms and the problems of biological time. The issues of comparability of biorhythms with rhythms of the habitat, the role of circadian clock genes in biological systems, as well as the basic concepts of ultradian rhythms, ontogenesis of circadian rhythms and cyclicity in the   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |   |





## 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                     |
|-------------------|---|---|--|
| LO1               | Demonstrates stable knowledge and skills in the field of philosophy, pedagogy and psychology, in the practice of his own research.  | Problematic conversation                                    | Presentation                           |
| LO2               | Applies a set of knowledge, skills and abilities for independent in-depth development of modern educational pedagogical technologies in the field of biology.   | Round table   | Preparation of the poster              |
| LO3               | Possesses the skills and abilities of independent effective creative and research activities; offers options for commercialization of the results of his scientific work.   | Discussion  | Abstract message                       |
| LO4               | Collects and interprets information to fulfill its own research concept, followed by the development of ways to use the results of scientific activity in practice.   | Individual and group work on educational Internet resources | Presentation                           |
| LO5               | Expands the list of modern IT technologies used for conducting training sessions and educational process activities in their professional activities.   | Project on the organization of educational space            | Presentation                           |
| LO6               | Develops new ways of using ICT to enrich the learning environment and increase the motivation of students.  | Practical work on educational platforms                     | Portfolio                              |
| LO7               | Analyzes the molecular mechanisms of biological processes; selects informative experimental methods of working with biological objects in field and laboratory conditions using modern equipment.                             | Problematic conversation                                    | Control and verification work          |
| LO8               | Offers solutions to current problems in the field of scientific evolutionary biology; explains the role of animals in ecosystems.   | Brainstorming   | "Map of concepts"                      |
| LO9               | Evaluates the possibilities of practical implementation of the theoretical provisions of chronobiology and evolutionary biology; develops approaches to research activities based on modern value concepts of nature.         | Research project  | Writing an essay                       |
| LO10              | Differentiates the main methods of teaching biology, selects innovative pedagogical technologies implemented in higher education and secondary specialized educational institutions for use in their professional activities. | Project on the organization of educational space            | Planning of different types of classes |
| LO11              | Explains the nuances of using biological terminology in English in professional communication.  | Practical work on educational platforms                     | Portfolio                              |
| LO12              | Deepens knowledge and expands the scope of skills in the field of theoretical and practical science for the successful assimilation of modern scientific achievements in various branches of biology.                         | Individual and group work on educational Internet resources | Presentation                           |

## Criteria for assessing the achievability of learning outcomes

| LO codes | Criteria   |
|----------|--|
| LO1      | <b>Knows:</b> basic epistemological models, the nature of transformations of the concept of rationality; forms and methods of pre-scientific, scientific and extra-scientific cognition, modern approaches to socio-humanitarian, natural science, pedagogical, psychological knowledge and their commensurability; pedagogy of higher education   |
|          | <b>Can:</b> use knowledge of psychology in management activities; organize research and professional pedagogical activities on the theoretical and methodological basis of pedagogical and psychological sciences.   |
|          | <b>Owens:</b> conceptual and categorical apparatus for solving research tasks and practical tasks; tools for applying knowledge of management psychology in professional activity;   |
| LO2      | <b>Knows:</b> features of the use of teaching tools in the educational process and methods of knowledge control in teaching biological disciplines   |
|          | <b>Can:</b> make notes and methodological developments of training sessions and other educational documentation that contribute to the organization and conduct of the educational process; organize and conduct training sessions and analyze them  |
|          | <b>Owens:</b> the skills of conducting various types of training sessions, compiling educational documentation and providing it to the educational process   |
| LO4      | <b>Can:</b> formulate and solve problems that arise in the course of research activities and require in-depth professional knowledge; choose the necessary research methods, modify existing and develop new methods based on the tasks of a specific study; analyze and comprehend the realities of modern theory and practice based on the methodology of socio-humanitarian, natural science, pedagogical and psychological knowledge |
|          | <b>Owens:</b> skills of independent research and scientific and pedagogical activity requiring a broad multidisciplinary education; skills of applying methodological and methodological knowledge in conducting scientific research, pedagogical and educational work; skills of writing scientific articles, abstracts, speeches at conferences, symposiums, round tables, discussions and debates;                                    |
| LO3      | <b>Knows:</b> the basic biological laws, the etymology of biological terms, the history of their origin and authorship, the thesaurus of the biologist (lexical minimum), eponyms and bibliographic data of scientists whose names are associated with the names used in various fields of biology   |
|          | <b>Can:</b> able to explain the etymology of basic biological terms, use literature to increase the terminological stock, understands biological texts in English  |
|          | <b>Owens:</b> translates biological information from English and vice versa, owns the basic technical means of searching for modern scientific and biological information, terminological and conceptual apparatus of basic and specialized biological disciplines   |
| LO6      | <b>Knows:</b> basic biological laws, concepts, mechanisms of biological processes  |
|          | <b>Can:</b> independently search and analyze the results of new biological research to deepen knowledge and expand the scope of professional skills in the field of theoretical and practical science in various branches of biology   |
| LO11     | <b>Can:</b> to carry out research activities in the relevant professional field using modern research methods and information and communication technologies in the process of forming a personal biological terminological apparatus - concepts and terms   |
| LO12     | <b>Knows:</b> features of specialized biological software and platform training  |
|          | <b>Owens:</b> skills to develop new ways of using ICT to enrich the learning environment and increase the motivation of students   |
| LO4      | <b>Can:</b> to collect and interpret information for the formulation and implementation of their own research concept, followed by the development of ways of practical use of the results of scientific activity  |



|      |  |
|------|--|
|      | <b>Owns:</b> specific methods of scientific research in independent research work  |
| LO5  | <b>Knows:</b> about the possibilities of commercialization of the results of their scientific work; methodology of scientific knowledge; principles and norms governing the commercialization of scientific and scientific-technical activities, contributing to the integration of education, science, production and institutions of innovative development  |
|      | <b>Can:</b> effectively and efficiently organize their activities; operate with systematic knowledge in the field of commercialization of scientific and scientific-technical activities, assessment of achievement of targets and indicators of program implementation, determination of tasks for the development and improvement of programs  |
|      | <b>Owns:</b> skills of independent creative, research work; skills of registration of the results of scientific research and compliance with the ethics of scientific knowledge; implementation (use) of the results of scientific and (or) scientific and technical activities in the educational process, including using professional foreign terminology; .analysis and use of innovative research approaches in the process of scientific development |
| LO7  | <b>Knows:</b> молекулярные механизмы биологических процессов   |
|      | <b>Can:</b> применять современные экспериментальные методы работы с биологическими объектами в полевых и лабораторных условиях   |
|      | <b>Owns:</b> basics of methods of working with modern equipment  |
| LO8  | <b>Knows:</b> ways of development and prospects of evolution and preservation of civilization; fundamentals of evolutionary processes, modern biospheric and evolutionary processes, the ability to assess them systematically   |
|      | <b>Can:</b> solve intellectual and personal problems (problems) in the field of scientific evolutionary biology and modern society   |
|      | <b>Owns:</b> methods of studying and classifying plants and animals, and their role in ecosystems  |
| LO9  | <b>Knows:</b> features of geopolitical and biospheric processes; mechanisms for predicting the consequences of the implementation of socially significant projects; new theories, research methods, new methodological approaches to biological research   |
|      | <b>Can:</b> plan, implement and analyze certain research activities based on modern value concepts of nature, evolutionary processes in it   |
|      | <b>Owns:</b> skills for the practical implementation of the theoretical provisions of evolutionary biology   |
| LO10 | <b>Knows:</b> features of the use of innovative pedagogical technologies for teaching biology; methodological possibilities of their use in their professional activities  |
|      | <b>Can:</b> apply innovative approaches to teaching in their profession; develop modern tools for implementing learning technologies; solve emerging problems as a teacher; find a compromise, correlate their opinion with the opinion of the team; comply with professional ethics, comply with ethical and moral standards of behavior.   |
|      | <b>Owns:</b> the skills of organizing the educational process using modern methods of teaching biology; the skills of generating new ideas for choosing methodological approaches in teaching, reflection with subsequent correction of their activities, teamwork, adequate orientation in pedagogical situations.  |

## Graduate Attributes

High professionalism in the implementation of the educational process in biology, Emotional stability, High intelligence  
Adaptability to the global challenges of the modern world, Leadership, Strong citizenship, Understanding of the importance of principles and culture of academic integrity

Form 8

## The graduate model of the educational program

| Types of competencies                                     | Description of competencies  |
|---|--|
| 1. Behavioral skills and personal qualities (Soft skills) | Has an idea about ethical, spiritual and cultural values, about the basic laws and forms of regulation of social behavior, about sociological approaches to personality, knows the traditions and culture of the peoples of Kazakhstan, trends in the development of society, is able to adequately navigate in various social situations, think creatively, be tolerant of traditions, culture of other peoples of the world, has an active life position; knows basic communication technologies and communication strategies, has a competent and developed speech in native and foreign languages, the skills and abilities of constructive dialogue, communication in a multicultural, polyethnic and multi-confessional society; is capable of critical perception of information, self-development and self-improvement, performance of their professional duties, competitive, motivated to actively participate in the procedures of leadership in the educational process, institution |
| 2. Digital competencies (Digital skills)                  | Understands the role of ICT in education, the basic principles of the use of ICT in the educational process; is able to expand the ICT used in professional activities; forms "technological literacy" among students and is able to develop new ways of using ICT to enrich the learning environment and the production of new knowledge; uses ICT to achieve educational results provided by educational standards, for evaluation activities, for the implementation of modern teaching methods; he is able to use ICT for current reporting and his professional development.  |
| 3. Professional competencies (Hard skills)                | Possesses basic knowledge of fundamental pedagogical and psychological disciplines that contribute to the formation of a highly educated personality with a broad outlook and a culture of thinking; creates conditions for the development of creative potential, initiative, innovation, acquisition of knowledge, skills and abilities in fundamental and applied biological disciplines; possesses basic knowledge and skills in biology and biology teaching methods to determine and solve tasks in pedagogical and research orientation; uses modern scientific methods, methodological techniques and modern educational technologies in his professional educational, pedagogical and research activities   |

### Developers:

Members of the working group:

Head of the Department of Zoology

Associate Professor of the Department of Zoology, C.B.S.

Associate Professor of the Department of Zoology, C.B.S., Ph.D.

Senior lecturer of the Department of Zoology

Master's student of group M-BO-22-1k

Master's student of the group M-BO-22-2r



A.Zh. Shaibek

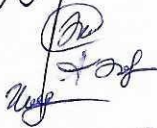
G.O. Zhuzbayeva

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G.Zh. Zhomartova

A. Zhumyrova

I. Kasenova



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

The educational program was reviewed at the meeting of the Academic Council from 18.04.2023 protocol No. 5

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

Board Member-Vice-Rector for Academic Work

Acting Director of the for Academic Work Department

Dean of the Faculty



T. Z. Zhussipbek

S.A. Smailova

S.A. Talzhanov



**EDUCATIONAL PROGRAM DEVELOPMENT PLAN  
7M01505– BIOLOGY**

**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**

| <b>№</b>  | <b>Indicators</b>  | <b>Unit of measurement</b> | <b>2023-2024</b> | <b>2024-2025</b> | <b>2025-2026</b> | <b>2026-2027</b> |
|-----------|--|----------------------------|------------------|------------------|------------------|------------------|
| <b>1</b>  | <b>Human resources development</b>   |                            |                  |                  |                  |                  |
| 1.1       | Increase in the number of teachers with academic degrees                                     | Number of people           | -                | 1                | 1                | 1                |
| 1.2       | Advanced training in the teaching profile  | Number of people           | 2                | 2                | 2                | 2                |
| 1.3       | Involvement of practitioners in teaching   | Number of people           | -                | 1                | 1                | 1                |
| 1.4       | Other  | Number of people           | 1                | 1                | 1                | 1                |
| <b>2</b>  | <b>Promotion of the EP in the ratings</b>  |                            |                  |                  |                  |                  |
| 2.1       | IQAA   | Position                   | 2                | 2                | 2                | 2                |
| 2.2       | IAAR   | Position                   | 6                | 6                | 5                | 5                |
| <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                | -                | 1                |
| 3.3       | Methodological recommendations/instructions  | Number                     | -                | 2                | 1                | 2                |
| 3.4       | Electronic textbook  | Number                     | -                | -                | 1                | 1                |

|           |  |        |   |   |   |   |
|-----------|--|--------|---|---|---|---|
| 3.5       | Video/audio lectures   | Number | - | - | - | - |
| 3.6       | Other  | Number | 2 | 2 | 2 | 2 |
| <b>4.</b> | <b>Development of educational and laboratory facilities</b>  |        |   |   |   |   |
| 4.1       | Purchase of software products  | Number | 1 | - | 2 | 1 |
| 4.2       | Purchase of equipment  | Number | 1 | 1 | 1 | 1 |
| 4.3       | Other  | Number | 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   | + | + | + | + |
| 5.4       | Opening of joint/two-degree program on the basis of the EP   | Year   | - | - | - | - |
| 5.5       | Other  | Year   |   |   |   |   |

Head of the department of zoology



A.Zh. Shaibek