

**MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE REPUBLIC OF KAZAKHSTAN  
ABAI KAZAKH NATIONAL PEDAGOGICAL UNIVERSITY**



**We train teachers who are able to anticipate the needs of modern education, based on advanced methods, national heritage and global approaches. We are increasing the prestige of the teaching profession and becoming a driver of human capital development.**

**EDUCATIONAL PROGRAM**

**7M01519 Biology (1.5 g profile)**

**Department of Biology**

**Almaty**

№	Name of discipline	Short description of discipline	Cycle	Component	Credits
1	Foreign language (professional)	Purpose: to develop students' communication skills in a foreign language in the professional field. Content: the study of terminology and language specifics in accordance with the professional field of students, as well as the development of writing, speaking, listening and reading skills, taking into account professional needs. Competencies: 1. Proficiency in professional vocabulary and grammar in a foreign language. 2. The ability to compose and understand texts of a professional nature. 3. Oral communication skills in a professional environment. 4. The ability to adapt culturally and interact with native speakers at a professional level. 5. The ability to use a foreign language to work with professional documentation and information. 6. The ability to apply the acquired knowledge and skills in practice in professional activities.	BD	UC	2
2	Management	Objective: to form a system of knowledge, skills and practical skills necessary for the management of a modern organization at different levels of management and to develop the ability and willingness to adequately and effectively use them to achieve the goals of the development of the organization. Content: This course covers the main range of issues related to the theory and practice of management: the environment of the organization; management functions; connecting processes; group dynamics and leadership; people in the organization. The basis of the methodology of consideration is an integrated approach that combines the most common, modern and relevant concepts and tools of all major schools and areas of management Competencies: professionally use psychological knowledge, skills in management activities, creatively approach the solution of various situations, tolerant and capable of pedagogical cooperation.	BD	UC	2
3	Management Psychology	Purpose: formation of knowledge about the psychological content and structure of management activities, psychological characteristics of the personality of the head and psychological patterns of joint activity of people to achieve organizational goals; formation of practical skills of psychological support of management activities in various fields of the national economy. Content: Management psychology is a section of psychology about the patterns of managerial activity. Analysis of psychological conditions, features of management activities. Diagnostics and forecasting of the state and changes of the management subsystem; formation of the program of subordinates' activities; organization of decision execution. Managerial needs and abilities of the head. Practical implementation in the form of the creation of diagnostic tools, the development of active methods of training managers, management consulting. Competencies: The ability to manage yourself and your emotions, build and maintain relationships with colleagues and subordinates. The ability to resolve	BD	UC	2

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		conflicts and cope with negative situations. Skills in developing management strategies and decision-making. The ability to motivate yourself and others. Skills of analyzing and understanding the behavior of people in an organization. The ability to lead a team and achieve goals. Time and resource management skills. The ability to work with changes and adapt to them.			
4	Actual methods of biology	Purpose: study materials on modern research methods in biology Content: familiarization with various research methods in various fields of biology, conducting educational and scientific research from setting goals to conclusions with the application of the necessary requirements for the design of a scientific report on the study, familiarity with General research methods in biology Competencies: applying the acquired skills to conduct research	BD	EC	4
5	Actual problems of biology	Purpose: study of modern problems and analysis of perspectives in biology Content: Problems of biology in the XXI century. Achievements and promising areas of Cytology, physiology, genetics, evolutionary theory, ecology and rational use of bioresources, nature protection. Competence: be able to use forecasting and planning methods in practice	BD	EC	4
6	Selected chapters of chronobiology	Purpose: getting knowledge about the temporary organization of a living system Contents: complex temporal organization of the studied indicator of the living system, biorhythms, rhythms of different frequencies that modulate each other; caused by age-related changes, diseases, treatment Competence: knowledge of modern problems of biological rhythms in nature	BD	EC	5
7	Methods of teaching biology in high school	Purpose: to study professional knowledge and skills in the field of biological education Content: Features of the content of biological education in higher education. Academic policy of the higher education institutions of Kazakhstan. Forms of higher education. Competence: ability and skills to teach biology subjects in higher education	PD	UC	5
8	Organization and planning of scientific research	Purpose: training of undergraduates to acquire methodological knowledge in the field of organization and planning of scientific research Content: Methodological principles and methods of scientific research. Structure and content of the stages of the research process. Methods of preparing a master's thesis. Competence: skills programming the sequence of complex research	PD	UC	5
9	Academic writing	Purpose: To develop skills in writing academic texts and persuasive arguments in accordance with the requirements of the academic community. Content: mastering the methods and structure of academic writing, including critical thinking, analysis and synthesis of research materials, argumentation and logical construction of the text. This discipline also aims to develop skills in working with sources,	PD	UC	5

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		citing and referencing in accordance with academic standards. As a result, successful mastering of the discipline should enable doctoral students to effectively and persuasively present their research findings and views to the academic community through publications, conferences and other forms of communication. Competencies: analyzing and critically evaluating information; structuring and organizing information; researching and finding sources of information; writing a paper; promoting one's arguments and views in the scientific community; critically searching for and improving one's professional competence.			
10	Mechanisms of plant adaptation	Purpose: to expand the understanding of the features of plant functioning under stress conditions Content: Specific features of the plant cell, its spatial and temporal organization. Photosynthesis and production process of plants in ecosystems. Competence: acquisition of skills of practical use of the main methods of plants	PD	EC	5
11	The morphology and physiology of the brain	Purpose: to study the integrative activity of the Central nervous system Contents: phylo- and embryogenesis of the nervous system. Functional significance of various parts of the spinal cord and brain. Coordination of the body's activity. Competence: readiness to use knowledge of modern problems of brain morphology and physiology	PD	EC	5
12	Radiation genetics	Purpose: to obtain basic knowledge about the biological effects of radiation and the risks at the cellular level for humans Contents: Genetic effects of ionizing radiation. General theory of radiation mutagenesis. The main regularities of radiation action on the mutation Competence: knowledge of modern problems of biologists, readiness to suggest	PD	EC	5
13	Radiobiology	The purpose of the discipline "Radiobiology" is to form students' knowledge of the effects of ionizing radiation on humans and animals, to give concepts about the prevention, recognition and treatment of diseases of radiation etiology, as well as the elimination of long-term effects of irradiation of individuals and their offspring. The objectives of the discipline "Radiobiology" are to familiarize with the factors of radiation nature that pose the greatest threat to human life, health and professional performance in emergency situations at the present stage; to familiarize with the biological effects of ionizing radiation, including molecular mechanisms of radiation damage to biosystems; to familiarize with the pathogenesis, manifestations of various forms of radiation damage; to familiarize with the development of measures, means and methods of anti-radiation protection in emergency situations; to show the radioecological consequences of modern wars and man-made accidents	PD	EC	5

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14	Regulation of cellular processes	Purpose: to obtain theoretical knowledge about the mechanisms of cell activity Contents: mechanisms occurring in the cell and patterns of individual development of organisms. Knowledge of the mechanisms that ensure normal ontogenetic development of a person allows future biologists Competence: to know the types of cells and stages of life	PD	EC	5
15	Modern research of intracellular processes	Purpose: to study current data on cell proliferation and their significance in biology Content: there are several systems for regulating cellular processes: genetic, energy, trophic, and hormonal. Their joint activity leads to rapid Competence: to be able to explain modern ideas about the structural and functional organization of a gene	PD	EC	5
16	Ecophysiology of plants	Purpose: to form a holistic view of the existence of plants in various environmental conditions Content: Specific features of the plant cell, its spatial and temporal organization. Photosynthesis and production process of plants in ecosystems. Competence: integration and generalization of knowledge in various sections of plant ecophysiology	PD	EC	5
17	STEAM technologies and modeling in biology	Goal: Familiarization of students with classical and modern methods of mathematical modeling and application of STEM technologies in biological research. Content: Overview of software products for applied modeling Software products for applied modeling. Construction of applied models. Working with images of biological objects. Principles of working with image visualization programs (Gimp, Axiovision, Zoombrowser). Working with databases	PD	EC	5