NJSC SHAKARIM UNIVERSITY OF SEMEY

EDUCATIONAL PROGRAM

6B01 - Pedagogical sciences
(Code and classifcation of the feld of education)

6B015 - Teacher training in natural science subjects
(Code and classifcation of the direction of training)

0114
(Code in the International Standard Classifcation of Education)

B013 - Biology teacher training
(Code and classifcation of the educational program group)

6B01510 - Biology
(Code and name of the educational program)

Bachelor
(Level of preparation)

Semey

Educational program

6B01 - Pedagogical sciences
(Code and classification of the field of education)

6B015 - Teacher training in natural science subjects
(Code and classification of the direction of training)

0114
(Code in the International Standard Classification of Education)

B013 - Biology teacher training
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6B01510 - Biology
(Code and name of the educational program)

Bachelor
(Level of preparation)

Semey 2023

PREFACE

Developed

The educational program 6B01510 - Biology in the direction of preparation 6B015 - Teacher training in natural science subjects on the basis of the State Compulsory Standards of Higher and Postgraduate Education approved by the Order ofthe Ministry of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022 No 2 (as amended by the order) was developed by the Academic Committee dated 20.02.2023 No 66).

Members of the Academic Committee	Full name	Academic degree, academic title, position	Signature
Head of the Academic Committee	Mukayev Zhandos	PhD, dean of the Faculty of Natural Sciencesand mathematics	
Educational program manager	Sadykova Raigul Zhumaniyazova Aigerim	Candidate of Agricultural Sciences, Senior Lecturer of the Department of NaturalSciences Teacher of the Department of Natural Sciences	
Member of the AC	Rakhimzhanova Akgul	PhD, Head of the Department of Natural Sciences	
Member of the AC	Saparova Gulnara	Candidate of Biological Sciences, Associate Professor of the Department of Natural Sciences	
Member of the AC	Kazhygeldiyeva Laura	Master of Pedagogical Sciences of the Department of Natural Sciences	
Member of the AC	Nygmedzhanova Gulbarshyn	Secondary school №16 T. Amanov KSU,biology subject teacher	
Member of the AC	Toleubaeva Gaukhar	Secondary School of KSU No. 37 Y. Altynsarin, biology teacher	
Member of the AC	Zhumabekova Nazgul	B-001, Group student, 3rd year	
Member of the AC	Kaldanova Dana	B-001, Group student, 3rd year	

Reviewing

Full name of the reviewer	Position, place of work	Signature
Malgazhdarova Zhanat	Director of the municipal state institution "Gymnasium No. 37 namedafter Ybyray Altynsarin"	

Reviewed

At the meeting of the Quality Assurance CommissionNatural and Mathematical of the faculty Recommended to be for approved
by the Academic Council of the University
Record No 4.1 "04" April 2023 y.
Chairman of the Commission Zheldybayeva B.S.

Agreed

Head of the education department of the city of Semey Bulabaev B.Z.

Approved at the meeting of the Academic Council of the University Protocol No. 8 "25" April 2023.

Approved

at the meeting of the Academic Council of the University
Protocol № 1 "01" of September 2023
Chairman of the Academic Council of the University Orynbekov D.R.

Content

1.Introduction

1.1.General data

The educational program 6B01510 - Biology, implemented at the Department of Natural Sciences of the Faculty of Natural Sciences and Mathematics, NAO "Shakarim University of Semey", was developed taking into account the needs of the regional labor market, the requirements of regulatory documents of the Ministry of Education and Science of the Republic of Kazakhstan and is a system of documents for the organization of the educational process.

Program the actual key and specific competences in the application of professional knowledge and skills acquired by learners in the learning outcome, which corresponds to the main mission of higher educational institutions - ensuring the leading role of University in international scientific and educational space for the formation of competitive specialists for the innovative development of Kazakhstan.

The educational program 6B01510-Biology is focused on the training of highly qualified biologists with knowledge and competencies that are in demand, first of all, for work in the field of education, to meet the needs of Kazakhstan and foreign higher educational institutions, schools, gymnasiums and lyceums, teacher training colleges, educational institutions of state and non-state profiles.

Kazakhstan, be able to plan and conduct training sessions taking into account the specifics of topics and sections of the program in accordance with the curriculum, as well as organizes a student-centered approach to the education and development of students in order to create motivation for learning.

1.2.Completion criteria

The main criterion for the completion of the educational process in the preparation of bachelors is the acquisition of at least 205 credits of theoretical training, as well as at least 27 credits of practice, not 8 credits for the preparation of diplomas. Total 240 credits.

1.3.Typical study duration: 4 year

2.PASSPORT OF THE EDUCATIONAL PROGRAM

2.1.EP purpose	Training of biology teachers with theoretical and practical knowledge in the field of modern areas of biological sciences and methods of teaching biology, able to apply the acquired competencies in teaching activities.
2.2.Map of the training profile within the educational program	
Code and classification of the field of education	6B01 - Pedagogical sciences
Code and classification of the direction of training	6B015 - Teacher training in natural science subjects
Code in the International Standard Classification of Education	0114
Code and classification of the educational program group	B013 - Biology teacher training
Code and name of the educational program	6B01510 - Biology
2.3.Qualification characteristics of the graduate	
Degree awarded / qualification	Bachelor of Education in the educational program
Name of the profession / list of positions of a specialist	Teacher. High School Teacher
OQF qualification level (industry qualification framework)	6
Area of professional activity	- biology teacher in high school, lyceum, gymnasium, college; - departments of education, akimats, organizations for landscaping, ecology; - science - research organizations in various biological profiles; - organizations of various forms of ownership that use biology methods in their work; - state-owned enterprises and institutions. - business, economics. - officials in educational organizations (director of a general educational institution, deputy directors for educational work, etc.) - methodologist in educational organizations; - specialist in the field of pedagogical sciences;
Object of professional activity	-general secondary schools, lyceums, gymnasiums colleges; - ecological and biological centers, agrobiostations; - higher educational institutions; - education departments under akimats; - research institutes and laboratories; - state environmental institutions - nature reserves, national parks and botanical gardens; - production laboratories and farms for processing raw materials of animal and vegetable origin; - organization of landscaping and landscaping of urban and natural areas; - ecology committees.
Types of professional activity	Educational (pedagogical) activity: work as a biology teacher in various educational institutions (schools, gymnasiums, lyceums, colleges, etc.); Research activity: performing scientific research in specialized disciplines in various organizations:

	laboratories, biocenters, zoos, nature reserves, national parks, botanical gardens Project activity: implementation of general and specialized developments in design and engineering organizations (landscaping, watering, reconstruction, landscape planning); Production and management activities: in state structures of various levels (departments of education, akimats, laboratories of biological and chemical directions, etc.); Organizational and technological activities: in biological industries (sanitary and epidemiological stations, plants and animal products processing plants, etc.).
Graduate Model	Distinctive features and opportunities, uniqueness of the educational program 6B01510– Biology are: ▯ high lecturing skills and mentoring and the availability of basic education of teaching staff; ▯ the use of innovative teaching methods by teachers in the classroom, interdisciplinary training, a local history approach in the study of; ▯ the demand for dual specialty specialists with higher pedagogical education in the region; ▯ the presence of continuity in two stages of bachelor`s - master`s degree ▯ formation of practical skills of students taking into account the real needs of employers. Acquired competencies expressed in the achieved learning outcomes As a result of studying in this direction, the student learns the following competencies: - is able to demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society; - possesses modern technologies of teaching and criteria-based assessment, taking into account the individual, physiological and psychological characteristics of students; - knows the basic provisions, concepts and laws in the field of natural sciences when explaining theoretical and practical tasks; -ready to develop educational resources using modern media and information technologies in the educational process; - able to demonstrate the results of experimental research work in the form of a report, a scientific report, a message, scientific conclusions; - owns educational material on all issues of the school and university curriculum of biological disciplines for everyday professional activities; - knows a variety of methods of teaching and upbringing in biology lessons; - I am ready to interpret information and sources from the point of view of their reliability and scientific character; - knows the patterns of formation of natural complexes and is able to identify the features of

	interaction between nature and society at the present stage; - is able to apply biological knowledge in pedagogical activity. Personal qualities of the graduate - ability to solve complex problems; - critical thinking; - creative thinking; - ability to work in a team; - the ability to recognize your own and other people`s emotions, manage them; - ability to form judgments and make decisions; - conducting negotiations; - switching from one task to another.

3.Modules and content of the educational program

Module 1. Fundamentals of social and humanitarian knowledge

Foreign language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26102 (3011397)
Course	1
Term	1
Credits count	5
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The content of the discipline «Foreign language» assumes the formation of students` intercultural and communicative competencies at B1 level. The discipline is aimed at mastering the knowledge, skills and abilities that allow using a foreign language in interpersonal communication and professional activity. All types of speech activity are taught, such as reading, writing, listening and production of texts of level complexity with a certain degree of grammatical and lexical correctness.

Purpose of studying of the discipline

Formation of intercultural and communicative competence of students in the process of foreign language education at a sufficient level (A2, pan-European competence) and the level of basic sufficiency (B1, pan-European competence). Depending on the level of training, the student at the time of completion of the course reaches the B1 level of the pan-European competence if the language level of the student at the start is higher than the A2 level of the pan-European competence.

Learning Outcomes

ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites

School course

Postrequisites

Foreign language

Kazakh language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26702 (3011399)
Course	1
Term	1
Credits count	5
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline is aimed at deepening the acquired knowledge of students in the framework of the school curriculum, as well as the use of language and speech means based on a full understanding of vocabulary and grammatical system of knowledge; the formation of socio-humanitarian worldview of students within the framework of the national idea of spiritual revival; free expression of mobile thought as a means of speech communication and in the process of communication; awareness of the national culture of the people, the ability to distinguish features of national cognition.

Purpose of studying of the discipline

Forms through phraseological units the recognition of national culture, its meaning as a linguistic unit related to spiritual culture; skills of identifying facts of national and cultural significance in the formation of Kazakh phraseology.

Learning Outcomes

ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites

School course

Postrequisites

Kazakh language

The module of socio-political knowledge (sociology, political science, cultural studies, psychology)

Discipline cycle	General educational disciplines

Discipline component	Compulsory component
SubjectID	25932 (3011490)
Course	1
Term	1
Credits count	8
Lections	30hours
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	55hours
Independent work of the student	110hours
Total	240hours
Knowledge control form	Examination

Short description of discipline

The module of socio-political knowledge involves the study of four scientific disciplines – sociology, political science, cultural studies, psychology, each of which has its own subject, terminology and research methods. Interactions between these scientific disciplines are carried out on the basis of the principles of information complementarity; integrativity; methodological integrity of research approaches of these disciplines; generality of the methodology of learning, result-oriented; unified system representation of the typology of learning outcomes as formed abilities.

Purpose of studying of the discipline

Formation of social and humanitarian worldview of students in the context of solving the problems of modernization of public consciousness, defined by the state program "Looking into the Future: Modernization of Public Consciousness".

Learning Outcomes

ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites

School course

Postrequisites

Philosophy

Russian language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26937 (3011401)
Course	1
Term	1
Credits count	5
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline is intended for the development of the language personality of the student, who is able to carry out cognitive and communicative activities in Russian in the areas of interpersonal, social, professional, intercultural communication; for teaching students practical mastery of the Russian language in various areas of communication and various situations, mastering the specifics of functional semantic types and genres of functional styles of speech, enriching the vocabulary with special vocabulary, forming and improving the skills of monologue and dialogic speech.

Purpose of studying of the discipline

The purpose of the program is to form the socio-humanitarian worldview of students in the context of the national idea of spiritual modernization, involving the development on the basis of national consciousness and cultural code of the qualities of internationalism, tolerant attitude to world cultures and languages as translators of world-class knowledge, advanced modern technologies, the use and transfer of which can ensure the modernization of the country and personal career growth of future specialists.

Learning Outcomes

ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites

School course

Postrequisites

Russian language

Physical Culture

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	31084 (3011405)
Course	1
Term	1

Credits count	2
Practical and seminar classes	60hours
Total	60hours
Knowledge control form	Differentiated attestation

Short description of discipline
It provides for the joint cooperation of a teacher and a student in the process of physical education throughout the training in the context of the requirements for the level of mastering the discipline, preparing students for participation in mass sports competitions; forms motivational and value attitudes towards physical culture and the need for systematic physical exercises and sports; gives basic knowledge about the use of physical culture and sports in the development of vital physical qualities.

Purpose of studying of the discipline
The purpose of the program is the formation of social and personal competencies of students and the ability to purposefully use the means and methods of physical culture, ensuring the preservation, strengthening of health to prepare for professional activities; to the persistent transfer of physical exertion, neuropsychic stress and adverse factors in future work.

Learning Outcomes
ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites
School course

Postrequisites
Physical Culture

Kazakh language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26938 (3011400)
Course	1
Term	2
Credits count	5
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is aimed at expanding language literacy, free communication with the environment and mental and ideological skills of the student, understanding the role of language in the process of mastering world-class knowledge through the formation of a future specialist`s worldview based on national consciousness and cultural code, improving the knowledge of the state language by future specialists, increasing the scope of use of the Kazakh language by specialists.

Purpose of studying of the discipline
Ensuring high-quality mastery of the Kazakh language as a means of social, intercultural, professional communication through the formation of communicative competencies at all levels of language use.

Learning Outcomes
ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites
Kazakh language

Postrequisites
Basic and profile disciplines of the EP

Foreign language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26545 (3011398)
Course	1
Term	2
Credits count	5
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The content of the discipline «Foreign language» assumes the formation of students` linguo-cultural, socio-cultural, cognitive and communicative competencies at B2 level.The discipline is aimed at deep and extended study of productive and receptive language material. As a result, the student must be able to understand all types of speech activity in accordance with the requirements of B2 level

and master the subject content of the discipline and speech.

Purpose of studying of the discipline

Formation of linguo- culturological, socio- cultural, cognitive and communicative competence of students in the process of foreign language education at the B2 level, pan-European competence. Depending on the level of training, the student at the time of completing the course reaches the level B2 of the common European competence, if the language level of the student at the start is higher than the level B1 of the common European competence.

Learning Outcomes

ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites

Foreign language

Postrequisites

Basic and profile disciplines of the EP

Bases of economics, law and ecological knowledge

Discipline cycle	General educational disciplines
Discipline component	University component
SubjectID	26725 (3011492)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline is integrated, which includes the main issues and principles in the field of fundamentals of law and anti-corruption culture, economics, entrepreneurship and leadership, ecology and life safety. Features of the use of regulatory legal acts, the ability to use business, ethical, social, economic, entrepreneurial and environmental norms of society. The specifics of environmental, legal, economic, entrepreneurial relations, leadership qualities and principles of the fight against corruption.

Purpose of studying of the discipline

It consists in studying the basic patterns of the functioning of living organisms, the biosphere as a whole and the mechanisms of their sustainable development under the conditions of anthropogenic impact and emergency situations; in understanding the concept of corruption, the legitimacy of the fight against it, the content of the state penal policy; in the formation of students` basic fundamental stable knowledge on the basics of economic theory, in instilling the skills and abilities of economic thinking; in introducing students to the theory and practice of entrepreneurship, to the basics of creating their own business; in the formation of theoretical knowledge and practical skills for the development and improvement of leadership qualities.

Learning Outcomes

ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites

School course

Postrequisites

Basic and profile disciplines of the EP

Russian language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26939 (3011402)
Course	1
Term	2
Credits count	5
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline is intended for the development of the language personality of the student, who is able to carry out cognitive and communicative activities in Russian in the areas of interpersonal, social, professional, intercultural communication; to teach the scientific style of speech as a language of specialty, the creation of secondary texts, the formation of skills for the production of oral and written speech in accordance with the communicative goal and the professional sphere of communication, instilling the skills of speech etiquette, business rhetoric.

Purpose of studying of the discipline

The purpose of the program is to form the socio-humanitarian worldview of students in the context of the national idea of spiritual

modernization, involving the development on the basis of national consciousness and cultural code of the qualities of internationalism, tolerant attitude to world cultures and languages as translators of world-class knowledge, advanced modern technologies, the use and transfer of which can ensure the modernization of the country and personal career growth of future specialists.

Learning Outcomes

ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites

Russian language

Postrequisites

Basic and profile disciplines of the EP

Physical Culture

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26940 (3011406)
Course	1
Term	2
Credits count	2
Practical and seminar classes	60hours
Total	60hours
Knowledge control form	Differentiated attestation

Short description of discipline

It provides for the joint cooperation of a teacher and a student in the process of physical education throughout the training in the context of the requirements for the level of mastering the discipline, the ability to exercise control and self-control in the process of classes, gaining knowledge on health promotion, hardening and increasing the body`s resistance to the effects of adverse factors of labor activity, mastering methods of selection of physical exercises and sports.

Purpose of studying of the discipline

The purpose of the program is the formation of social and personal competencies of students and the ability to purposefully use the means and methods of physical culture, ensuring the preservation, strengthening of health to prepare for professional activities; to the persistent transfer of physical exertion, neuropsychic stress and adverse factors in future work.

Learning Outcomes

ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites

Physical Culture

Postrequisites

Physical Culture

History of Kazakhstan

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26880 (3011488)
Course	2
Term	1
Credits count	5
Lections	30hours
Practical and seminar classes	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Qualification examination

Short description of discipline

The main stages of the history of Kazakhstan are studied with: nomadic statehood, Turkic civilization, the era of colonialism, the Soviet period, independence. The driving forces, trends, patterns of historical development are analyzed; problems: ethnogenesis of the Kazakh people, the formation of statehood, national liberation movements, demographic development. The skills of analyzing historical events and facts, working with historical literature are being formed.

Purpose of studying of the discipline

The purpose of the discipline is to provide objective knowledge about the main stages of the development of the history of Kazakhstan from ancient times to the present.

Learning Outcomes

ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites

School course

Postrequisites
Philosophy

Physical Culture

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26881 (3011407)
Course	2
Term	1
Credits count	2
Practical and seminar classes	60hours
Total	60hours
Knowledge control form	Differentiated attestation

Short description of discipline
Provides for the joint cooperation of the teacher and the student in the process of physical education throughout the training in the context of the requirements for the level of mastering the discipline; increasing the level of physical fitness and developing physical qualities; mastering the technique of sports; education of discipline, collectivism, comradely mutual assistance; education of mental stability, development and improvement of basic motor qualities - endurance, strength, speed, dexterity, flexibility.

Purpose of studying of the discipline
The purpose of the program is the formation of social and personal competencies of students and the ability to purposefully use the means and methods of physical culture, ensuring the preservation, strengthening of health to prepare for professional activities; to the persistent transfer of physical exertion, neuropsychic stress and adverse factors in future work.

Learning Outcomes
ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites
Physical Culture

Postrequisites
Physical Culture

Information and communication technology

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26908 (3011491)
Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is aimed at mastering the conceptual foundations of the architecture of computer systems, operating systems and networks by students; formation of the ability to critically understand the role and signifcance of modern information and communication technologies in the era of digital globalization, new "digital" thinking, knowledge about the concepts of developing network and web applications, skills in using modern information and communication technologies in various felds of professional activity, scientifc and practical work, for self-educational and other purposes.

Purpose of studying of the discipline
Formation of the ability to critically evaluate and analyze processes, methods of searching, storing and processing information, methods of collecting and transmitting information through digital technologies.

Learning Outcomes
ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites
School course

Postrequisites
Basic and profile disciplines of the EP

Physical Culture

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26942 (3011408)
Course	2

Term	2
Credits count	2
Practical and seminar classes	60hours
Total	60hours
Knowledge control form	Differentiated attestation

Short description of discipline
Provides for the joint cooperation of the teacher and the student in the process of physical education throughout the training in the context of the requirements for the level of mastering the discipline; acquisition of versatile abilities and skills for the development of physical abilities, socio-cultural experience and socio-cultural values of physical culture and sports; development of communication skills, thinking, self-development, the formation of experience in the implementation of sports and recreational and training programs.

Purpose of studying of the discipline
The purpose of the program is the formation of social and personal competencies of students and the ability to purposefully use the means and methods of physical culture, ensuring the preservation, strengthening of health to prepare for professional activities; to the persistent transfer of physical exertion, neuropsychic stress and adverse factors in future work.

Learning Outcomes
ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites
Physical Culture

Postrequisites
Basic and profile disciplines of the EP

World of Abai

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26919 (3011467)
Course	2
Term	2
Credits count	3
Lections	15hours
Practical and seminar classes	15hours
Independent work of a student under the guidance of a teacher	20hours
Independent work of the student	40hours
Total	90hours
Knowledge control form	Examination

Short description of discipline
The discipline is aimed at studying historical facts, the philosophical and artistic foundations of the works of Abay Kunanbaev, Shakarim Kudaiberdiev, which form worldview and aesthetic values, the student`s ability to express his opinion, practical skills and perception of such human qualities as morality, honesty, artistic character. The genius of the writers of Kazakh literature and the role of M. Auezov in the study and popularization of Abai`s heritage, the significance of his works for history, literature and science are determined.

Purpose of studying of the discipline
Formation of the meaning of philosophical and ideological being, understanding of the problems raised in the works of Abai Kunanbayuly, Shakarim Kudaiberdiuly, Mukhtar Auezov and application of the acquired knowledge in the practice of everyday life.

Learning Outcomes
ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites
Kazakh language The module of socio-political knowledge (sociology, political science, cultural studies, psychology)

Postrequisites
Basic and profile disciplines of the EP

Philosophy

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	26998 (3011396)
Course	3
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline is aimed at developing students` openness of consciousness, understanding their own national code and self-consciousness, spiritual modernization, competitiveness, realism and pragmatism, independent critical thinking, the cult of knowledge and education, a holistic view of philosophy as a special form of understanding the world, mastering key worldview concepts, as well as the development and strengthening of the values of tolerance, intercultural dialogue and a culture of peace.

Purpose of studying of the discipline

Formation in students of a holistic view of philosophy as a special form of knowledge of the world, its main sections, problems and methods of studying them in the context of future professional activities.

Learning Outcomes

ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Prerequisites

History of Kazakhstan The module of socio-political knowledge (sociology, political science, cultural studies, psychology)

Postrequisites

Basic and profile disciplines of the EP

Module 2. Psychological-pedagogical and methodological training of personnel

Age psychology and physiology

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26708 (3011468)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The course allows you to form an idea of human anatomy and physiology, the specifics and features of age-related development, the patterns of higher nervous activity and functional features of the human nervous system are considered. Forms students` systematic understanding of mental and physiological development in ontogenesis, the main patterns of development and neoplasms of age, the most important mental features of the emerging personality of the child on the basis of taking into account psychophysiological norms.

Purpose of studying of the discipline

Formation of students` ideas about the diversity of approaches to the development of correct, scientific knowledge, mental and physiological development of a person in ontogenesis on the most important issues of psychology and physiological development in the aspect of cultural development. To equip students with theoretical and practical knowledge that contributes to strengthening their professional psychological, pedagogical and physiological training, in- depth study of the section of psychological and physiological knowledge.

Learning Outcomes

ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.

Prerequisites

School course

Postrequisites

Pedagogical practice Pedagogical practice (psychological and pedagogical)

Pedagogy

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26941 (3011471)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The content of the discipline is aimed at forming students` holistic understanding of the theoretical and methodological foundations of pedagogical science and the essence of professional pedagogical activity. Studying the course allows you to form the necessary knowledge about the content, principles, forms and methods of organizing a holistic pedagogical process in an educational environment.

The study of the course forms the necessary competencies for the successful implementation of modern approaches in teaching and learning.

Purpose of studying of the discipline

Pedagogy as an academic discipline aims to form students` knowledge about the object and subject of pedagogy, its functions, categorical apparatus, methodology of science. The study of the course provides for the formation of the necessary competencies in the design and evaluation of the pedagogical process in the conditions of an educational institution.The content of the discipline topics allows you to acquire knowledge and skills in the selection and successful application of forms, means, methods of teaching and upbringing.

Learning Outcomes

ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.

Prerequisites

School course

Postrequisites

Basic and profile disciplines of the EP

Inclusive education

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26888 (3011469)
Course	2
Term	1
Credits count	3
Lections	15hours
Practical and seminar classes	15hours
Independent work of a student under the guidance of a teacher	20hours
Independent work of the student	40hours
Total	90hours
Knowledge control form	Examination

Short description of discipline

When studying the discipline, students acquire knowledge about the principles and methodological foundations of inclusive education. Ideas are being formed about modern models of psychological and pedagogical support for children with special needs, the elimination of existing barriers in the legal support of inclusive education and the competence of organization and management in the area of inclusive practice. Get an idea about the models of psychological and pedagogical support for children with disabilities in educational institutions.

Purpose of studying of the discipline

The purpose of this discipline is to familiarize students with the basic provisions of the organization and management of inclusive processes in education; the formation of a dynamic, effective, self-improving specialist, ready for professional activity in an inclusive education, owning innovative technologies for building an educational route for all students, taking into account their individual needs and capabilities, able to provide social psychological and pedagogical support for children and their families.

Learning Outcomes

ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.

Prerequisites

Age psychology and physiology

Postrequisites

Basic and profile disciplines of the EP

Pedagogical practice (psychological and pedagogical)

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26944 (3011444)
Course	2
Term	2
Credits count	2
Pedagogical practics	60hours
Total	60hours
Knowledge control form	Total mark on practice

Short description of discipline

The content of psychological and pedagogical practice is aimed at forming an idea about the peculiarities of the organization of the educational and pedagogical process and the management system in the holistic pedagogical process of the school. The student gets acquainted with all types and directions of the teacher`s activities, including the system of work of the class teacher, observation during lessons and extracurricular activities, psychological and pedagogical diagnostics of the age characteristics of the development of students, conducts psychological and pedagogical educational work.

Purpose of studying of the discipline

The purpose of pedagogical practice is the formation of professional pedagogical competencies related to the design and implementation of the educational process of teaching in the education system, providing conditions for the social and professional

adaptation of students, mastering the norms and values of the teaching profession, gaining experience in practical pedagogical activity, becoming a professional orientation of their personality

Learning Outcomes

ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.

Prerequisites

Pedagogy

Postrequisites

Pedagogical practice

Methodology of biology training

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	32958 (3011479)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

This course provides for the formation of students` knowledge about science in the process of teaching the subject of biology, studied in the school curriculum. The course is compiled in accordance with the updated requirements of education, new innovative technologies, group work of students. Skills are assessed by students in the form of project defense, solving and writing tests, essays.

Purpose of studying of the discipline

The purpose of teaching methods of biology as an academic discipline is the development of the major problems of education and training subjects of the biological cycle to school, to familiarize students with the organizational forms of educational process, methods and methodological techniques of biology lessons.

Learning Outcomes

ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.
ON5 Possess a system of methodological knowledge and skills that ensure readiness to effectively carry out the educational process in biology at school, independence and creativity in their teaching activities. Be able to reconstruct various parts of previously acquired knowledge into a new context in accordance with current trends in the development of biology and use it in their professional activities.

Prerequisites

Technologies of the updated content of education and criteria assessment

Postrequisites

Methods of organization of extracurricular work on the subject

Rules and principles of the content of the living corner

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26922 (3011420)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The subject allows students to expand their understanding of the world of animals and plants, acquired during the study of the chapters `Plants` and `Animals`. It is designed to work with schoolchildren who are looking for direct contact with nature, who want to learn more about the behavior and physiological characteristics of animals, who want to help them. Under the guidance of a teacher, the student can enjoy the beautiful natural objects in the system, learn more about animals and interesting things to explore in detail.

Purpose of studying of the discipline

formation of systematic knowledge and skills in the field of creating a living corner, to ensure the professional readiness of students for this activity, taking into account current trends and promising areas

Learning Outcomes

ON5 Possess a system of methodological knowledge and skills that ensure readiness to effectively carry out the educational process in biology at school, independence and creativity in their teaching activities. Be able to reconstruct various parts of previously acquired

knowledge into a new context in accordance with current trends in the development of biology and use it in their professional activities.
ON10 Demonstrate knowledge of theoretical disciplines and apply them in professional activities; consolidate the skills of independent planning and conducting research experiments.

Prerequisites

Technologies of the updated content of education and criteria assessment

Postrequisites

Methods of organization of extracurricular work on the subject

Technologies of the updated content of education and criteria assessment

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26930 (3011465)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The main goal of reforming Kazakhstan`s education system is to update the quality of education and increase the competitiveness of the national education system. Ensuring high quality education that meets international standards of education, the formation of a creative personality ready for self-education, self-education, self-development, involves improving the quality of Kazakhstan`s education and achieving an international level.

Purpose of studying of the discipline

To study pedagogical methods and approaches of effective teaching and learning aimed at the formation of skills of the 21st century.

Learning Outcomes

ON2 Apply modern teaching technologies and criteria-based assessment, taking into account the individual, physiological and psychological characteristics of students.

Prerequisites

Pedagogy

Postrequisites

Basic and profile disciplines of the EP

Technology biology training in English

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26923 (3011421)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

This course develops students` organizational skills and the ability to use various teaching methods for the main sections of the school biology course. Uses modern pedagogical technologies in teaching biology in English. It allows future teachers to form methodological skills and knowledge, a creative approach to independent pedagogical activity for the effective implementation of educational processes in the course of biology at school.

Purpose of studying of the discipline

The aim of this course is to prepare students to features of teaching biology in the English language in schools and other educational institutions. Teaching biology in a foreign language was able to successfully apply modern teaching technology. Preparing the future teacher of competitive professional multilingual teacher.

Learning Outcomes

ON5 Possess a system of methodological knowledge and skills that ensure readiness to effectively carry out the educational process in biology at school, independence and creativity in their teaching activities. Be able to reconstruct various parts of previously acquired knowledge into a new context in accordance with current trends in the development of biology and use it in their professional activities.
ON10 Demonstrate knowledge of theoretical disciplines and apply them in professional activities; consolidate the skills of independent planning and conducting research experiments.

Prerequisites

Technologies of the updated content of education and criteria assessment

Postrequisites
Methods of organization of extracurricular work on the subject

Pedagogical practice

Discipline cycle	Basic disciplines
Discipline component	Compulsory component
SubjectID	27000 (3011404)
Course	3
Term	2
Credits count	5
Pedagogical practics	150hours
Total	150hours
Knowledge control form	Total mark on practice

Short description of discipline
introduces student practitioners to the work of all structures of an educational institution. The passage of pedagogical practice forms the necessary professional skills in the future profession, professional skills of pedagogical reflection and critical assessment of the pedagogical process among student practitioners. apply, interpret and implement practical and theoretical knowledge acquired in the process of studying at the university.

Purpose of studying of the discipline
apply, interpret and implement practical and theoretical knowledge acquired in the process of studying at the university.

Learning Outcomes
ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
Final examination

Production (pedagogical) practice

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27125 (3011489)
Course	4
Term	2
Credits count	15
Working practice	450hours
Total	450hours
Knowledge control form	Total mark on practice

Short description of discipline
The practice has an integrative character, as it is learned on the skills, abilities and competencies acquired by students during the passage of all types of practices. The purpose of the practice is to create conditions that allow students to acquire practical skills in teaching and master the basics of teaching skills.

Purpose of studying of the discipline
to create conditions that allow students to acquire practical skills in teaching and master the basics of teaching skills.

Learning Outcomes
ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.
ON10 Demonstrate knowledge of theoretical disciplines and apply them in professional activities; consolidate the skills of independent planning and conducting research experiments.

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
Final examination

Module 3. Fundamentals of Biology

Introduction to the Biology Teaching Profession

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26520 (3011487)
Course	1
Term	1
Credits count	3
Lections	15hours
Practical and seminar classes	15hours

Independent work of a student under the guidance of a teacher	20hours
Independent work of the student	40hours
Total	90hours
Knowledge control form	Examination

Short description of discipline
This discipline develops understanding, the ability to organize the educational process of work and improves the pedagogical skills of future biology teachers. Gives skills for the effective use of pedagogical approaches and methodological materials in the subject of biology. Students form an understanding of the specifics of their future professions as a biology teacher.

Purpose of studying of the discipline
to form students` holistic view of the educational complex of the educational organization and of the teacher as the main subject of educational activity.

Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.

Prerequisites
School course

Postrequisites
Basic and profile disciplines of the EP

Anatomy and Morphology of Plants

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26728 (3011415)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	0hours
Laboratory works	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This subject teaches the morphological and anatomical structure of plant cell organoids, anatomical and morphological structure of roots, stems, leaves, reproductive organs, flowers, seeds of lower and higher plants. This also explains the differences and similarities in the structure of plants of lower and higher plants. And also studies the floral structure of higher flowering plants, from which double fertilization occurs. Цель To study the internal and external structure of the plant organism, micro-macrostructure of plants, features of adaptation, changes in the process of ontogenesis, methods of reproduction.

Purpose of studying of the discipline
To study the internal and external structure of the plant organism, micro-macrostructure of plants, features of adaptation, changes in the process of ontogenesis, methods of reproduction.

Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.

Prerequisites
School course

Postrequisites
Plant Physiology

Biochemistry

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31150 (3011446)
Course	1
Term	2
Credits count	3
Lections	15hours
Practical and seminar classes	0hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	20hours
Independent work of the student	40hours
Total	90hours

Knowledge control form	Examination

Short description of discipline
During the development of this course, students gain knowledge about the structure and properties of chemical compounds that make up living organisms, the basic laws of biochemical processes and the mechanisms of metabolism regulation. Students will develop their knowledge of organic chemistry and biology in the context of interdisciplinary communication, as well as develop skills in working with information sources, systematization, and independent search. Promotes the application of acquired knowledge in professional, scientific and cognitive activities.

Purpose of studying of the discipline
To reveal the place of biochemistry in a number of other natural disciplines, its importance in the life of modern society and to study the patterns of biochemical reactions in the body of plants, animals and

Learning Outcomes
ON4 To explain the chemical nature of a living organism using theoretical knowledge about the basic properties and structures of substances, patterns of chemical reactions.

Prerequisites
School course

Postrequisites
Basic and profile disciplines of the EP

Inorganical chemistry

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31151 (3011447)
Course	1
Term	2
Credits count	3
Lections	15hours
Practical and seminar classes	0hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	20hours
Independent work of the student	40hours
Total	90hours
Knowledge control form	Examination

Short description of discipline
This discipline provides for the study of the concept of chemical elements and their compounds; their properties, methods of obtaining and application; trends in the development of inorganic chemistry. When studying the course, students develop systemic knowledge about the structure of substances, about the characteristics of elements, about a comparative analysis of the physical and chemical properties of chemical elements.

Purpose of studying of the discipline
To get acquainted with the chemical classification of elements, the properties of chemical elements and their compounds.

Learning Outcomes
ON4 To explain the chemical nature of a living organism using theoretical knowledge about the basic properties and structures of substances, patterns of chemical reactions.

Prerequisites
School course

Postrequisites
Basic and profile disciplines of the EP

General Chemistry

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26732 (3011445)
Course	1
Term	2
Credits count	3
Lections	15hours
Practical and seminar classes	0hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	20hours
Independent work of the student	40hours
Total	90hours
Knowledge control form	Examination

Short description of discipline
This course provides for the study of the foundations of general chemistry, the importance of atomic and molecular science; modern understanding of the chemical bond, the theory of solutions. When studying the course, students develop systemic knowledge about the basic chemical concepts, the dependence of the properties of substances on the nature of the chemical bond.

Purpose of studying of the discipline
To master the theoretical foundations of general chemistry.
Learning Outcomes
ON4 To explain the chemical nature of a living organism using theoretical knowledge about the basic properties and structures of substances, patterns of chemical reactions.
Prerequisites
School course
Postrequisites
Basic and profile disciplines of the EP

Training practice

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26730 (3011418)
Course	1
Term	2
Credits count	2
Study practics	60hours
Total	60hours
Knowledge control form	Total mark on practice

Short description of discipline
An active form of preparing students for their future professional activities by monitoring the work of teachers. During the practice, the student understands, analyzes, remembers, listens and studies, forms initial knowledge- skills, skills in pedagogical and research activities. This practice allows you to make sure that your professional choice is correct, evaluate your efforts in the chosen profession, learn to see yourself as a specialist, increases interest.
Purpose of studying of the discipline
formation of students` complete understanding of the chosen profession, acquaintance with the main types and directions of professional activity.
Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.
Prerequisites
Introduction to the Biology Teaching Profession
Postrequisites
Basic and profile disciplines of the EP

Human anatomy

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26892 (3011475)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline considers the formation of a scientific understanding of the features of the internal structure of the human body. During the course, students develop systematic knowledge about human morphology, the anatomy of individual organs and systems, as well as the relationship in the human body with the motor, digestive, respiratory, circulatory, endocrine, genitourinary, nervous systems and sensory organs. The course contributes to the development of anatomical and morphological knowledge of students.
Purpose of studying of the discipline
Students gain knowledge about the structure and functioning of the human body, the basic laws of growth and development of children and adolescents, morphology features.
Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.
Prerequisites
School course
Postrequisites
Human and animal physiology

Anatomy, the basics of sports morphology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26895 (3011477)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The course is aimed at forming students` systematic knowledge about the structure and functions of the human body, changes in the body as a whole under the influence of various physical activities or sports activities. This course focuses on the anatomy of muscles and the physiology of human activity based on sports activity. The acquired knowledge of the course teaches students practical use for maintaining a healthy lifestyle.

Purpose of studying of the discipline

Students gain knowledge about the structure and functioning of the human body, the basic laws of growth and development of children and adolescents, the features of sports morphology of athletes.

Learning Outcomes

ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.

Prerequisites

School course

Postrequisites

Human and animal physiology

Geobotany

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26887 (3011417)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	0hours
Laboratory works	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

This is a fundamental subject of the botanical cycle, which considers plant communities by types of vegetation, their phytocenoses and ecological and floristic features, their place in the ecosystem, their influence and dependence on the environment, their interaction with other components of the ecosystem`s vegetation. In the course of studying the discipline, students expand their knowledge in the field of biogeography, that is, the laws of the geographical position of organisms and their associations, their place in science, and practical significance

Purpose of studying of the discipline

Mastering knowledge about the vegetation cover of the Earth as a set of plant communities and the patterns of their distribution.

Learning Outcomes

ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.

Prerequisites

Anatomy and Morphology of Plants

Postrequisites

Big practicum in botany

Invertebrate Zoology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26882 (3011409)

Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	0hours
Laboratory works	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline provides for the study of issues related to the main issues of the biological diversity of the animal world, as well as their evolutionary relationships and systematics. When studying the course, students develop systemic knowledge about the general patterns of development and origin of various groups of invertebrates, about the role of animals in the environment and human life, about the principles of the structure of organs and systems, differentiation and integration of body functions, about the main patterns of reproduction and development animals

Purpose of studying of the discipline
To introduce the morphofunctional, taxonomic and ecological diversity of invertebrates, their evolution and significance in human life.

Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.

Prerequisites
School course

Postrequisites
Evolutionary Theory

Medicinal plants

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26885 (3011416)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	0hours
Laboratory works	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This course deals with the classification of higher plants, the phylogeny of the main taxonomic groups, the theoretical and practical significance of important plant groups. Biologically active substances in medicinal plants, the identification of their new effective properties make it possible to study plant species used as medicinal raw materials. Forms students` theoretical knowledge about herbal remedies and materials used in various diseases.

Purpose of studying of the discipline
Formation of students` scientific knowledge and skills in the rational use of medicinal plant resources.

Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.

Prerequisites
Anatomy and Morphology of Plants

Postrequisites
Big practicum in botany

Parasitology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26884 (3011411)
Course	2
Term	1
Credits count	5
Lections	15hours

Practical and seminar classes	0hours
Laboratory works	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline involves the study of various systematic groups of parasites. When studying the course, students form systematic knowledge about the history of parasitology, about the features of the structure of parasites at all stages of development, about the systematics of parasitology objects, about the parasite-host relationship, about the features of the development cycle of parasites and vectors, about habitats, the spread of parasitic diseases in certain territories, as well as about control measures and methods of prevention with parasites and vectors.

Purpose of studying of the discipline
The course of choice «Parasitology» reflects the current state of science about the relationship of parasitic organisms with animals and humans.

Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.

Prerequisites
School course

Postrequisites
Evolutionary Theory

Plant Sistematic

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26891 (3011472)
Course	2
Term	1
Credits count	5
Lections	15hours
Laboratory works	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This course is aimed at studying classical and modern methods of studying the vegetation cover, getting acquainted with the taxonomy of species characteristics of plants, distribution areas, the relationship of species, instilling in students theoretical knowledge of plant systematics, developing skills for independent work with plant objects. Considers the relationship of plants between themselves and the environment, determines the importance of plants and ways to protect them. In the process of studying the course, students will master the methods of studying plants in a natural phytocenosis.

Purpose of studying of the discipline
to contribute to the preparation of young specialists - botanists for research work: memorization and reproduction of the studied material; mastering botanical methods in practical and research work; the ability to analyze the studied material; correct assessment of the studied material

Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.

Prerequisites
Anatomy and Morphology of Plants

Postrequisites
Big practicum in botany

Comparative anatomy of humans and animals

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26894 (3011476)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours

Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline considers the formation of a natural and scientific understanding of the structure of each organ of man and animals. While studying the course, students gain knowledge on the embryonic development of humans and animals, comparative morphology and anatomy of the skeleton, blood transport, respiration, digestion, genitourinary, nervous systems and sensory organs. Includes the study of general patterns of the structure and development of the organ system

Purpose of studying of the discipline
Students gain knowledge about the structure of organs, organ systems and organisms of animals and humans in general and in a comparative aspect.

Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.

Prerequisites
School course

Postrequisites
Human and animal physiology

Entomology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26883 (3011410)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	0hours
Laboratory works	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline provides for the study of various systematic groups of the insect class. Students acquire knowledge about the history of entomology, about the systematics and classification of insects, about the features of the external and internal structure and functions of various organs of hexapods, about modern methods of studying insect groups, also about the general principles of insect breeding, about improving breeding technology, about sanitary and epidemiological control and methods of preserving the gene pool of insect cultures.

Purpose of studying of the discipline
In the process of studying the discipline entomology, students should know the biodiversity of animals, their importance in nature and human life, the areas of their distribution.

Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.

Prerequisites
School course

Postrequisites
Evolutionary Theory

Virology

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26900 (3011429)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The study of this discipline forms students` in-depth professional knowledge in the field of virology, makes it possible to independently plan and conduct scientific research by acquiring new theoretical knowledge about their origin in nature and the morphology of viruses. They gain skills in laboratory studies of viruses using various experimental forms, acquire new knowledge based on the specifics of the specialty, including communication with other disciplines.
Purpose of studying of the discipline
the lighting of modern ideas about the structural organization of tissues and their interactions with each other and with environment.
Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.
Prerequisites
School course
Postrequisites
Evolutionary Theory

Microbiology

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26899 (3011428)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Microbiology introduces students to the properties of microorganisms, their physiology and metabolism, and determines the practical role of microorganisms in the environment, medicine, and biotechnology. Students should be able to study microorganisms in laboratory studies, prepare a nutrient medium for microorganisms, know how to decompose them in laboratory conditions and the rules for working with them.
Purpose of studying of the discipline
to acquaint students with the world of microorganisms and their basic properties, to determine the overall biological significance of the achievements of microbiology, to demonstrate the connection of microbiology with other biological areas, and also to determine the ideological and socio-ethical significance of microbiology. In order to master the course "Microbiology and Virology", students need knowledge of low molecular weight biological molecules, inorganic chemistry, botany, zoology, and biochemistry.
Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.
Prerequisites
School course
Postrequisites
Evolutionary Theory

Microbiology with fundamentals of Virology

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26898 (3011427)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The course includes the study of the basic concepts and methods of microbiology and virology. Students, using microorganisms in modern biotechnologies, develop knowledge about the metabolism of bacteria, their growth, reproduction, taxonomy, health care, environmental protection. The student orients and systematizes the acquired knowledge and skills in the field of microbiology and virology, depending on the characteristics of the vital activity of microorganisms, and also uses them in the future profession of a teacher

Purpose of studying of the discipline
The course "Microbiology" aims to acquaint students with the most important properties of prokaryotes. To show the General biological significance of achievements in the field of Microbiology; to determine the relationship of Microbiology with other biological disciplines, to highlight the ideological and socio-ethical significance of discoveries in the field of Microbiology.
Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.
Prerequisites
School course
Postrequisites
Evolutionary Theory

Vertebrate Zoology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26907 (3011412)
Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline gives a complete picture of the features of the structure and physiological behavior of vertebrates, as well as their relationship with the environment and biodiversity. In the course of mastering the course, students develop knowledge about the patterns of organization of vertebrates, that is, the principles of the structure of organs and systems and life, taxonomy, geographical distribution, beneficial and harmful species of animals, and the purposes of using the animal world in the national economy.
Purpose of studying of the discipline
to provide specific knowledge on the structure, processes of vital activity, ecology, behavior, distribution and diversity of vertebrates.
Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.
Prerequisites
Invertebrate Zoology
Postrequisites
Evolutionary Theory

Ichthyology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26910 (3011414)
Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline provides for the study of morphology, anatomy, ecology and the history of fish development. When studying the course, students form systematic knowledge about the external and internal structure of fish, adaptation to the environment, embryology and phylogeny, geographical distribution and abundance of fish, patterns of its change, ethology, methods for determining productive fish stocks, scientifically based measures of fish conservation and fisheries, knowledge of effective ways of organization is formed.
Purpose of studying of the discipline
to study the diversity and phylogeny of fish, the features of internal and external structure.
Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.

Prerequisites
Invertebrate Zoology
Postrequisites
Evolutionary Theory

Ornithology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26909 (3011413)
Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline includes knowledge about systematics, individual and historical development, physiology, ecology of birds. In the course of mastering the discipline, students receive extensive knowledge about the avifauna of Kazakhstan. Knowledge is being formed about the laws of the origin of birds, the principles of the structure of organs and systems, as well as the patterns of distribution on earth, the role of birds as carriers of pathogens of various diseases, in connection with which parasites and the spread of various diseases among humans and animals.
Purpose of studying of the discipline
The purpose of the discipline is to study the diversity and phylogeny of birds, the peculiarities of internal and external structure.
Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.
ON 8 Possess knowledge about the resource value of ichthyofauna, herpetofauna, ornithofauna and mammalian fauna. Describe the biodiversity, ecological status and significance of the most important animal representatives of Kazakhstan.
Prerequisites
Invertebrate Zoology
Postrequisites
Evolutionary Theory

Field training practice

Discipline cycle	Basic disciplines
Discipline component	Compulsory component
SubjectID	26918 (3011478)
Course	2
Term	2
Credits count	2
Pedagogical practics	60hours
Total	60hours
Knowledge control form	Total mark on practice

Short description of discipline
This course provides for the study of issues related to field research of invertebrates and plants. When studying the course, students develop systemic knowledge about the general patterns of distribution in various biotopes of invertebrate animals and plants, about field research methods, methods for describing, collecting, identifying and herbarizing plants, methods for determining invertebrate animals in the laboratory and in natural habitats.
Purpose of studying of the discipline
The purpose of field practice in the course of invertebrate zoology is to study animals in natural conditions and identify the main patterns of their ecology.
Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.
Prerequisites
Invertebrate Zoology Anatomy and Morphology of Plants
Postrequisites
Evolutionary Theory

Physiology of analyzers

Discipline cycle	Basic disciplines
Discipline component	Electives

SubjectID	26917 (3011474)
Course	2
Term	2
Credits count	5
Lections	15hours
Laboratory works	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline gives an idea of the objective and subjective aspects of the physiology of analyzers. When mastering the course, students get acquainted with the general properties of analyzers - vision, balance, taste, smell, soma- sensory systems, general principles of construction, as well as the meaning in cognition of the world, functions of detection, discrimination, skipping, signal conversion to another state, coding, i.e. thresholds for distinguishing sensitivity with questions and laws.

Purpose of studying of the discipline
to study the general principles of organization, structural and functional structure, classification of analyzers.

Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.

Prerequisites
Human anatomy

Postrequisites
Evolutionary Theory

Human and animal physiology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26916 (3011473)
Course	2
Term	2
Credits count	5
Lections	15hours
Laboratory works	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline provides for the theoretical physiological conditions in the body and the interpretation of the life of the body. When studying the course, systematic knowledge is formed about the life of a living organism, individual systems, organs, tissues and cells, the influence on each other, the relationship and relationships with the external environment.

Purpose of studying of the discipline
To study the features of the vital activity of the human and animal organism in a changing environment and the mechanisms of neuro-humoral regulation

Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.

Prerequisites
Human anatomy

Postrequisites
Evolutionary Theory

Ecological physiology of humans and animals

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26915 (3011454)
Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	0hours
Laboratory works	30hours

Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline studies the features of the life of the human body and the mechanisms of its adaptation in a constantly changing environment, the dependence of the functions of organs and physiological systems on the effects of environmental factors in various physical and geographical zones, natural cycles. The impact on the human body of working and living conditions, increasing physical and emotional-psychological stress, as well as stressful situations is considered

Purpose of studying of the discipline
The purpose of the discipline is to study the vital activity of the organism as a whole, physiological systems, organs, cells and individual cellular structures under the action of various environmental factors.

Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.

Prerequisites
Human anatomy

Postrequisites
Evolutionary Theory

Module 4. Innovative biological education

Electronic educational resources

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26921 (3011419)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The course consists in getting acquainted with the theoretical and methodological aspects of the technological approach in education, teaches methods of modeling the educational process through the use of modern technologies used in the process of teaching biology, develops the creative potentials of the future biology teacher for further self-education. Forms the motivational orientations of students towards innovative activity and apply a system-activity approach in teaching to achieve personal, meta-subject and subject learning outcomes and ensure the quality of the educational process by means of the taught subject.

Purpose of studying of the discipline
formation of systematized knowledge in the field of methods of using and creating electronic educational resources.

Learning Outcomes
ON5 Possess a system of methodological knowledge and skills that ensure readiness to effectively carry out the educational process in biology at school, independence and creativity in their teaching activities. Be able to reconstruct various parts of previously acquired knowledge into a new context in accordance with current trends in the development of biology and use it in their professional activities.
ON6 Structure natural science material in biology and design the process of teaching biology. Critically evaluate scientific content in the field of biology and related sciences, put forward ideas for their transformation.

Prerequisites
Information and communication technology

Postrequisites
Form and methods of STEM education

Methods of organization of extracurricular work on the subject

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	27107 (3011464)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours

Total	150hours
Knowledge control form	Examination

Short description of discipline
The method of organization of extracurricular activities on the subject, considers the content and organization of extracurricular activities, its goals and objectives in the educational process. get acquainted with the forms and types of extracurricular activities, tools to increase the effectiveness of extracurricular and research work. We consider modern methods of organizing and conducting clubs, optional courses in biology, methods of organizing and conducting various forms and types of extracurricular activities

Purpose of studying of the discipline
Formation of professional pedagogical competence of a bachelor in organization of the pedagogical process aimed at organizing work with students and developing competencies that allow them to carry out professional social and psychological and pedagogical activities in educational institutions outside of school hours

Learning Outcomes
ON5 Possess a system of methodological knowledge and skills that ensure readiness to effectively carry out the educational process in biology at school, independence and creativity in their teaching activities. Be able to reconstruct various parts of previously acquired knowledge into a new context in accordance with current trends in the development of biology and use it in their professional activities.

Prerequisites
Methodology of biology training

Postrequisites
Production (pedagogical) practice

Methods of solving problems in genetic

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27113 (3011461)
Course	4
Term	1
Credits count	5
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline considers the methodology of solving and design of typical and combined genetic problems, is an addition to the previous theoretical course of genetics, develops students` skills in analyzing the distribution of hereditary traits in a number of generations, reveals the causes and consequences of the ratio of traits in natural populations, forms skills in constructing genetic maps of various types of organisms. Also, the purpose of this discipline is to teach methods of explaining the progress of solving problems in biology lessons

Purpose of studying of the discipline
To acquaint students with the ways of solving problems according to the basic laws of heredity and variability, to master the methodology of solving complex Olympiad problems.

Learning Outcomes
ON9 Explain the main mechanisms of heredity and variability; apply methods of statistical data analysis, forecasting and modeling of biological and environmental processes, including using modern information technologies. To argue the basic laws of individual and historical development of living organisms.
ON10 Demonstrate knowledge of theoretical disciplines and apply them in professional activities; consolidate the skills of independent planning and conducting research experiments.

Prerequisites
Genetics

Postrequisites
Final examination

The organization of research work at the school

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27115 (3011422)
Course	4
Term	1
Credits count	5
Lections	0hours
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The course forms students` practical skills and abilities to use the results of scientific research in the educational process. In the process of studying this discipline, the student develops general cultural, general professional and professional competencies. The ability to take into account modern trends in the development of technology and technology in their professional activities

Purpose of studying of the discipline

The purpose of the discipline is the formation of systemic knowledge on history, theory and practice of the development of science, its role in social production; the formation of practical skills and abilities to use the results of scientific research in the educational process.

Learning Outcomes

ON5 Possess a system of methodological knowledge and skills that ensure readiness to effectively carry out the educational process in biology at school, independence and creativity in their teaching activities. Be able to reconstruct various parts of previously acquired knowledge into a new context in accordance with current trends in the development of biology and use it in their professional activities.
ON6 Structure natural science material in biology and design the process of teaching biology. Critically evaluate scientific content in the field of biology and related sciences, put forward ideas for their transformation.

Prerequisites

Genetics

Postrequisites

Final examination

Professional English in biology classes at school

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27122 (3011423)
Course	4
Term	1
Credits count	5
Lections	0hours
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The course deepens and expands students` theoretical knowledge by mastering the laws and concepts of biology in English. Develops students` critical thinking, communicative, cognitive, professional and general cultural competencies. Allows you to get acquainted with modern world scientific literature, expand your lexical base and linguistic worldview in English, systematize your knowledge of biology in a foreign language.

Purpose of studying of the discipline

Deepening and expanding the theoretical knowledge of students about the basic concepts and patterns in biology and strengthening this knowledge in English, and also provides an additional opportunity for students to train critical thinking.

Learning Outcomes

ON5 Possess a system of methodological knowledge and skills that ensure readiness to effectively carry out the educational process in biology at school, independence and creativity in their teaching activities. Be able to reconstruct various parts of previously acquired knowledge into a new context in accordance with current trends in the development of biology and use it in their professional activities.
ON6 Structure natural science material in biology and design the process of teaching biology. Critically evaluate scientific content in the field of biology and related sciences, put forward ideas for their transformation.

Prerequisites

Genetics

Postrequisites

Final examination

Form and methods of STEM education

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	27112 (3011466)
Course	4
Term	1
Credits count	6
Lections	15hours
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	40hours
Independent work of the student	80hours
Total	180hours
Knowledge control form	Examination

Short description of discipline

The course provides for the use of interdisciplinary and applied approaches based on the synthesis of STEM technologies in science, technology, engineering, mathematics, combining learning into a single learning scheme in these areas. The main world trends in education, focused on the study of logical, engineering thinking, imagination, critical thinking, cause-and-effect relationships. STEM

technology develops students` research, engineering, technology, mathematics, and design skills.

Purpose of studying of the discipline

Formation of an educational environment to ensure the quality of education, including with the use of information technologies appropriate to the age characteristics of students and reflecting the specifics of the subject area;

Learning Outcomes

ON5 Possess a system of methodological knowledge and skills that ensure readiness to effectively carry out the educational process in biology at school, independence and creativity in their teaching activities. Be able to reconstruct various parts of previously acquired knowledge into a new context in accordance with current trends in the development of biology and use it in their professional activities.
ON10 Demonstrate knowledge of theoretical disciplines and apply them in professional activities; consolidate the skills of independent planning and conducting research experiments.

Prerequisites

Methodology of biology training

Postrequisites

Final examination

Module 5. Fundamentals of Applied Biology

Big practicum in plant physiology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26912 (3011451)
Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

Course - to introduce students with structural biochemical plant features and methods analyzing their metabolic activity, giving the knowledge and skills required for work with plant objects in modern scientific laboratories. Knows the structure and functions of plant cell organoids, patterns of plant growth and development, physiological bases of plant resistance.

Purpose of studying of the discipline

coverage of the current state of knowledge about the general patterns of plant life; identification of the relationship between the main biological processes, as well as the dependence of these processes on environmental conditions.

Learning Outcomes

ON 7 Possess knowledge about the resource value of plants in Kazakhstan; describe the diversity of the structure of cells, tissues and vegetative organs of various plant groups; evaluate the evolutionary significance of morphological structures of plants. To develop skills in the image of design and planning solutions for the construction of landscape compositions.

Prerequisites

Anatomy and Morphology of Plants

Postrequisites

Applied Biology with the Basics of Soil Science

Plant Physiology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26911 (3011442)
Course	2
Term	2
Credits count	5
Lections	15hours
Laboratory works	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

This subject forms professional knowledge and skills in mastering a profession. Plant physiology is one of the fundamental subjects for the study of wildlife. Physiology reveals the significance of processes in plants, their relationship, changes under the influence of the external environment, establishes regulatory mechanisms, and creates methods aimed at increasing the productivity of crops. Experimental work; the ability to conduct experimental work with living organisms. This is especially important for professional and pedagogical training of students.

Purpose of studying of the discipline

to give modern ideas about the nature of the main physiological processes of a plant, the mechanisms of their regulation at different levels of organization of the plant organism and the main patterns of interconnection with the environment; with the principles of system organization, differentiation, integration of body functions.

Learning Outcomes

ON 7 Possess knowledge about the resource value of plants in Kazakhstan; describe the diversity of the structure of cells, tissues and vegetative organs of various plant groups; evaluate the evolutionary significance of morphological structures of plants. To develop skills in the image of design and planning solutions for the construction of landscape compositions.

Prerequisites

Anatomy and Morphology of Plants

Postrequisites

Applied Biology with the Basics of Soil Science

Physiology of growth and development of plants

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26914 (3011452)
Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

Plant physiology is the science of the activities of plant organisms. Physiology reveals the meaning of the processes occurring in plants, determines their relationship, changes under the influence of the external environment, their mechanisms, regulation, creates methods aimed at increasing the productivity of various crops. He can explain various natural phenomena in terms of plant physiology, conduct educational experiments on plant physiology, and explain the results.

Purpose of studying of the discipline

to study the basic physiological processes of plant organisms, to reveal the essence of the life processes of plants, to identify their dependence on environmental conditions in order to control the course of growth and development of plants

Learning Outcomes

ON 7 Possess knowledge about the resource value of plants in Kazakhstan; describe the diversity of the structure of cells, tissues and vegetative organs of various plant groups; evaluate the evolutionary significance of morphological structures of plants. To develop skills in the image of design and planning solutions for the construction of landscape compositions.

Prerequisites

Anatomy and Morphology of Plants

Postrequisites

Applied Biology with the Basics of Soil Science

Applied Biology with the Basics of Soil Science

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	27126 (3011430)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The course explains the connection with other subjects by introducing students to natural sciences and agriculture through theoretical and practical training. Students form the necessary knowledge for the organization of work at the school experimental site. Students will learn to evaluate the physico- chemical properties of soil, environmental factors and their significance for plants, as well as the evolutionary significance of morphological structures of plants and will be able to interpret the results of biological research.

Purpose of studying of the discipline

theoretical and practical education, acquaintance with the field of agriculture, explanation of the relationship with other sciences, equipping them with the knowledge necessary for the organization of work in the experimental plots at school, teaching methods of conducting scientific research of educational value.

Learning Outcomes

ON 7 Possess knowledge about the resource value of plants in Kazakhstan; describe the diversity of the structure of cells, tissues and

vegetative organs of various plant groups; evaluate the evolutionary significance of morphological structures of plants. To develop skills in the image of design and planning solutions for the construction of landscape compositions.
ON 8 Possess knowledge about the resource value of ichthyofauna, herpetofauna, ornithofauna and mammalian fauna. Describe the biodiversity, ecological status and significance of the most important animal representatives of Kazakhstan.

Prerequisites
Plant Physiology

Postrequisites
Bioresources Kazakhstan

Soil biology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	27022 (3011463)
Course	3
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Soil biology studies the micro- and macroflora, micro- and macrofauna of the soil habitat, the peculiarities of the relationship of edaphobionts and the influence of various groups of organisms on the change of the physico-chemical properties of the soil and the improvement of its fertility. The discipline considers the distribution of the population density of the soil environment depending on the thermal, water and air regimes, as well as the function of living matter in the process of soil formation and the influence of a complex of environmental factors on soil biology.

Purpose of studying of the discipline
To study the main factors of soil formation, patterns of geographical distribution of soils, classification and characteristics of the main types of soils in Kazakhstan, morphological, physical, theoretical foundations and management methods in the field of use and protection of soil cover.

Learning Outcomes
ON 7 Possess knowledge about the resource value of plants in Kazakhstan; describe the diversity of the structure of cells, tissues and vegetative organs of various plant groups; evaluate the evolutionary significance of morphological structures of plants. To develop skills in the image of design and planning solutions for the construction of landscape compositions.

Prerequisites
Big practicum in botany

Postrequisites
Landscape design

Plant biotechnology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	27001 (3011431)
Course	3
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The course "Plant Biotechnology" aims to highlight the current state of knowledge about the biologyof cultivated plant cells as an object of biotechnology. At the end of the course, the student will be proficient in information and communication technologies for organizing work and solving standard professional tasks in the specialty.

Purpose of studying of the discipline
to study biology of the cultivated cages and the production technology of the revitalized landing material of the most important the agriculture of cultures, creation of new grades with use of genetic engineering and receiving important substances of a phytogenesis.

Learning Outcomes
ON 7 Possess knowledge about the resource value of plants in Kazakhstan; describe the diversity of the structure of cells, tissues and vegetative organs of various plant groups; evaluate the evolutionary significance of morphological structures of plants. To develop skills in the image of design and planning solutions for the construction of landscape compositions.

Prerequisites

Plant Physiology

Postrequisites

Bioresources Kazakhstan

Indoor and decorative floriculture

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	27013 (3011443)
Course	3
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline `Indoor and decorative floriculture` studies the biological features of indoor plants, their sequence and place in human life. Also, students studying this discipline gain knowledge about the influence of environmental factors on ornamental plants, methods of reproduction, as well as about the features of using leading types of decorative flowers as objects of landscape architecture elements.

Purpose of studying of the discipline

Formation of knowledge about the types of decoratively grown flowers and their ecology, planting, flower care and methods of their reproduction.

Learning Outcomes

ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.

ON 7 Possess knowledge about the resource value of plants in Kazakhstan; describe the diversity of the structure of cells, tissues and vegetative organs of various plant groups; evaluate the evolutionary significance of morphological structures of plants. To develop skills in the image of design and planning solutions for the construction of landscape compositions.

Prerequisites

Big practicum in botany

Postrequisites

Landscape design

Organization works on the school grounds

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	27006 (3011432)
Course	3
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The course of work organization at the school site is designed to expand and deepen knowledge of applied biology. In the course of studying this course, students will gain basic knowledge of agricultural technology, will be able to describe the diversity of the structure of cells, tissues and vegetative organs of various plant groups, and will learn to evaluate the evolutionary significance of morphological structures of plants. They will also master the methods of organizing work at the school site and the skills of socially useful work.

Purpose of studying of the discipline

students receive knowledge on proper organization of various activities in the school educational precinct; the formation of theoretical knowledge and practical skills necessary for professional activities.

Learning Outcomes

ON5 Possess a system of methodological knowledge and skills that ensure readiness to effectively carry out the educational process in biology at school, independence and creativity in their teaching activities. Be able to reconstruct various parts of previously acquired knowledge into a new context in accordance with current trends in the development of biology and use it in their professional activities.

Prerequisites

Plant Physiology

Postrequisites

Bioresources Kazakhstan

Ecology of plants

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	27021 (3011462)
Course	3
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Plant ecology studies the influence of a complex of environmental factors on the morpho-physiological characteristics of various plant species, the relationship of various groups and life forms of plants in phytocenoses and biogeocenoses, the basics of conservation and restoration of phytocenoses, ecological-biological and ecological-geographical foundations of the functioning of plant communities, the basics of correction and restoration of plant communities. The discipline forms students` systematic knowledge about the basic laws of the distribution of vegetation cover

Purpose of studying of the discipline
tto form students` comprehensive understanding of the ecological properties of plants and their communications, as well as systematized knowledge about the main characteristics and patterns of distribution of vegetation cover on the Earth`s surface.

Learning Outcomes
ON 7 Possess knowledge about the resource value of plants in Kazakhstan; describe the diversity of the structure of cells, tissues and vegetative organs of various plant groups; evaluate the evolutionary significance of morphological structures of plants. To develop skills in the image of design and planning solutions for the construction of landscape compositions.
ON9 Explain the main mechanisms of heredity and variability; apply methods of statistical data analysis, forecasting and modeling of biological and environmental processes, including using modern information technologies. To argue the basic laws of individual and historical development of living organisms.

Prerequisites
Big practicum in botany

Postrequisites
Landscape design

Big practicum in botany

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27023 (3011424)
Course	3
Term	2
Credits count	5
Practical and seminar classes	15hours
Laboratory works	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination and term work/Project

Short description of discipline
Contains information about various systematic groups of plants, structural features of each systematic group, taking into account their ecological confinement. The main objectives of the course are to reveal at a high modern level the diversity and structure of plant forms and the development of their structures in an evolutionary aspect, to show the relationship between plants and the environment, to determine the significance of plants and ways to protect them

Purpose of studying of the discipline
formation of students` theoretical and practical knowledge of modern morphology, anatomy and systematics of plants, development of students` interest in conducting scientific research in the field of botany.

Learning Outcomes
ON 7 Possess knowledge about the resource value of plants in Kazakhstan; describe the diversity of the structure of cells, tissues and vegetative organs of various plant groups; evaluate the evolutionary significance of morphological structures of plants. To develop skills in the image of design and planning solutions for the construction of landscape compositions.

Prerequisites
Anatomy and Morphology of Plants

Postrequisites
Landscape design

Big practiccum in zoology

Discipline cycle	Profiling discipline
Discipline component	Electives

SubjectID	27102 (3011457)
Course	3
Term	2
Credits count	5
Lections	0hours
Practical and seminar classes	15hours
Laboratory works	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This course provides knowledge about the structural features of different groups of animals. Gives systematic knowledge about the shape of the body, skeleton, skin, digestive system, circulatory system, respiration and digestion, nervous and sensory organs, reproductive system, development, as well as methods for determining species of invertebrates and vertebrates, the importance and rationality of vertebrates in agriculture and basic usage methods .

Purpose of studying of the discipline
mastering zoological methods in practical and research work; analysis of the studied material; correct analysis, generalization of the research material.

Learning Outcomes
ON 8 Possess knowledge about the resource value of ichthyofauna, herpetofauna, ornithofauna and mammalian fauna. Describe the biodiversity, ecological status and significance of the most important animal representatives of Kazakhstan.

Prerequisites
Invertebrate Zoology Vertebrate Zoology

Postrequisites
Landscape design

Nature protection in Kazakhstan

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27024 (3011425)
Course	3
Term	2
Credits count	5
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination and term work/Project

Short description of discipline
The discipline considers the distribution of organisms in nature according to the ecosystem and landscape- geographical principle, taxonomic groups, the influence of factors on wildlife. Teaches the specifics of various protected areas – nature reserves, nature reserves, national nature parks, ethnic territories, places of recreation and recreation. Future specialists will be taught how to effectively use the natural resources of protected areas as a means of optimizing environmental management, correctly apply fundamental environmental laws.

Purpose of studying of the discipline
formation of ideas about the main types of specially protected natural territories and the peculiarities of their functioning, consideration of the practice of biodiversity conservation and prospects for the development of various areas of wildlife protection and management of the natural world.

Learning Outcomes
ON 7 Possess knowledge about the resource value of plants in Kazakhstan; describe the diversity of the structure of cells, tissues and vegetative organs of various plant groups; evaluate the evolutionary significance of morphological structures of plants. To develop skills in the image of design and planning solutions for the construction of landscape compositions.
ON 8 Possess knowledge about the resource value of ichthyofauna, herpetofauna, ornithofauna and mammalian fauna. Describe the biodiversity, ecological status and significance of the most important animal representatives of Kazakhstan.

Prerequisites
Anatomy and Morphology of Plants

Postrequisites
Landscape design

Taxonomy of animals

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27026 (3011456)
Course	3
Term	2

Credits count	5
Lections	0hours
Practical and seminar classes	15hours
Laboratory works	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This course provides knowledge about the levels of structural organization and taxonomic groups of animals, as well as phylogeny. During the course, students develop systematic knowledge about the features of the structure, development and lifestyle of different groups of animals, the relationship of animals with the environment, adaptation, patterns of diversity and geographical distribution of invertebrates and vertebrates, their significance for humans.

Purpose of studying of the discipline
the study of diversity, structural features, animal life, adaptability to the environment, zoning distribution, increasing their productivity, rational use and conservation of its reserves in nature.the study of diversity, structural features, animal life, adaptability to the environment, zoning distribution, increasing their productivity, rational use and conservation of its reserves in nature.

Learning Outcomes
ON 8 Possess knowledge about the resource value of ichthyofauna, herpetofauna, ornithofauna and mammalian fauna. Describe the biodiversity, ecological status and significance of the most important animal representatives of Kazakhstan.

Prerequisites
Invertebrate Zoology Vertebrate Zoology

Postrequisites
Landscape design

Evolutionary adaptation of plants

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27103 (3011483)
Course	3
Term	2
Credits count	5
Practical and seminar classes	15hours
Laboratory works	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The subject of plant evolutionary adaptation studies anatomical, morphological, physiological and biochemical adaptations (the presence of a long root system, which in conditions of soil and atmospheric drought with a lack of moisture can reach several tens of meters, which contributes to the use of groundwater by the plant, the presence of a thick cuticle in xerophytes, the ability of leaves to roll back, the transformation of leaves into thorns, reducing the loss of water), as well as evolutionary, ontogenetic and urgent adaptive processes.

Purpose of studying of the discipline
To give students knowledge about the laws and directions of evolutionary development, the main stages of phylogeny of the main systems of organs and tissues of plants.

Learning Outcomes
ON 7 Possess knowledge about the resource value of plants in Kazakhstan; describe the diversity of the structure of cells, tissues and vegetative organs of various plant groups; evaluate the evolutionary significance of morphological structures of plants. To develop skills in the image of design and planning solutions for the construction of landscape compositions.
ON9 Explain the main mechanisms of heredity and variability; apply methods of statistical data analysis, forecasting and modeling of biological and environmental processes, including using modern information technologies. To argue the basic laws of individual and historical development of living organisms.

Prerequisites
Anatomy and Morphology of Plants

Postrequisites
Landscape design

Animal ecology

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27025 (3011455)
Course	3
Term	2
Credits count	5

Lections	0hours
Practical and seminar classes	15hours
Laboratory works	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This subject allows you to understand the scientific basis of various environmental phenomena of animals, environmental laws common to all living organisms. In the course of mastering the course, students develop knowledge about the types of interaction of living organisms with their environment and living organisms, about the natural patterns of communication, about the impact on nature and economy and human health, about the patterns of adaptation to environmental factors, animal populations.

Purpose of studying of the discipline
The purpose of the discipline is to study the mechanisms and basic principles of interaction of biological systems with the environment of animals at various levels of organization.

Learning Outcomes
ON3 Demonstrate scientific ideas about the diversity and systematics of the animal and plant world, knowledge about the human body and animals as an integral system. Possess the methodology of determining plants and animals, the skills of naturalistic work and environmental activities.
ON 8 Possess knowledge about the resource value of ichthyofauna, herpetofauna, ornithofauna and mammalian fauna. Describe the biodiversity, ecological status and significance of the most important animal representatives of Kazakhstan.

Prerequisites
Invertebrate Zoology Vertebrate Zoology

Postrequisites
Landscape design

Plant biogeography

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27108 (3011449)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline considers the distribution of living organisms and communities in the environment, the significance of the patterns of structure and distribution of vegetation on the planet and in its individual regions. The ecological foundations of biogeography, ecological factors and their interaction, the laws of vegetation differentiation on land and in the ocean, and the geographical distribution of cultivated plants are studied. Topical issues of biodiversity and conservation of biological resources have been studied.

Purpose of studying of the discipline
providing fundamental and applied knowledge about the patterns of territorial distribution of plants in their interaction with the environment.

Learning Outcomes
ON 7 Possess knowledge about the resource value of plants in Kazakhstan; describe the diversity of the structure of cells, tissues and vegetative organs of various plant groups; evaluate the evolutionary significance of morphological structures of plants. To develop skills in the image of design and planning solutions for the construction of landscape compositions.

Prerequisites
Big practicum in botany

Postrequisites
Final examination

Hydrobiology

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27114 (3011450)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours

Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The course covers aquatic ecosystems, structure, functional features, ecological systematics of the hydrosphere, as well as the biological resources of the oceans, rivers, lakes and reservoirs, i.e. aquatic life. Teaches the functions and evolution of aquatic organisms in accordance with the basic general biological laws of various biosystems. Water ecosystems, their structural and holistic representations, their rational use in accordance with protection from pollution builds competencies.

Purpose of studying of the discipline
Formation of students` understanding of aquatic ecosystems, their structures and functional features, the ecological state of the hydrosphere and scientific forecasting of its condition.

Learning Outcomes
ON 8 Possess knowledge about the resource value of ichthyofauna, herpetofauna, ornithofauna and mammalian fauna. Describe the biodiversity, ecological status and significance of the most important animal representatives of Kazakhstan.

Prerequisites
Big practicum in botany

Postrequisites
Final examination

Landscape design

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27111 (3011482)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The course allows you to improve the theoretical and practical knowledge of students in the field of creating landscape compositions and using them in the interior of the school. Students will get acquainted with the basic principles of landscape design, layout, stylistics, zoning in the design of territories that allow a person to change the environment. Also, the proposed course develops skills in the image of design and planning solutions, forms knowledge of professional terms of landscape art.

Purpose of studying of the discipline
Formation of a system of theoretical knowledge and practical skills for the creation of landscape compositions and their use in interiors and open environmental situations, the formation of microclimate, image improvement.

Learning Outcomes
ON 7 Possess knowledge about the resource value of plants in Kazakhstan; describe the diversity of the structure of cells, tissues and vegetative organs of various plant groups; evaluate the evolutionary significance of morphological structures of plants. To develop skills in the image of design and planning solutions for the construction of landscape compositions.

Prerequisites
Big practicum in botany

Postrequisites
Final examination

Module 6. Genetics and evolution

Animals and plants bielander

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26929 (3011440)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The course examines the biodiversity of the environment, how to protect and use them. Studies monitoring of biodiversity conservation and sustainability of ecosystems, diversity of plants and animals, their structural and functional adaptation to environmental conditions, determination of their place in the biocenosis. Expands the theoretical knowledge of students about the modern systematics of living organisms, the adaptation of plants and animals to evolutionary processes.
Purpose of studying of the discipline
Study of the biological diversity of the environment, protection and its rational use.
Learning Outcomes
ON 7 Possess knowledge about the resource value of plants in Kazakhstan; describe the diversity of the structure of cells, tissues and vegetative organs of various plant groups; evaluate the evolutionary significance of morphological structures of plants. To develop skills in the image of design and planning solutions for the construction of landscape compositions.
ON 8 Possess knowledge about the resource value of ichthyofauna, herpetofauna, ornithofauna and mammalian fauna. Describe the biodiversity, ecological status and significance of the most important animal representatives of Kazakhstan.
Prerequisites
Plant Sistematic
Postrequisites
Bioresources Kazakhstan

Genetics

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26925 (3011480)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Genetics is a basic discipline in the preparation of future biology teachers, studies the basic laws of inheritance of traits and their variability, considers the cytological foundations of mono- and dihybrid crossing, features of non-allelic interaction of genes. Genetics introduces the main provisions of the chromosomal theory of heredity, reveals the causes.
Purpose of studying of the discipline
Formation of students` knowledge system on the fundamental genetic foundations of the emergence and functioning of living organisms and biocenoses on Earth, their stability, variability and development in ontogeny and phylogeny.
Learning Outcomes
ON9 Explain the main mechanisms of heredity and variability; apply methods of statistical data analysis, forecasting and modeling of biological and environmental processes, including using modern information technologies. To argue the basic laws of individual and historical development of living organisms.
Prerequisites
Introduction to the Biology Teaching Profession
Postrequisites
Methods of solving problems in genetic

Population genetics

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26926 (3011481)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline population genetics studies the genetic diversity of populations, the patterns of heredity and variability in natural populations, the distribution of allele frequencies in populations under the influence of evolutionary factors. The purpose of population genetics is to determine genetic variations among different populations of the same species. Comparing the genetic composition of different populations can give an idea of the gene flow.
Purpose of studying of the discipline

Formation of basic knowledge of students about the mechanisms of heredity and variability in populations.

Learning Outcomes

ON9 Explain the main mechanisms of heredity and variability; apply methods of statistical data analysis, forecasting and modeling of biological and environmental processes, including using modern information technologies. To argue the basic laws of individual and historical development of living organisms.

Prerequisites

Introduction to the Biology Teaching Profession

Postrequisites

Methods of solving problems in genetic

Genetic engineering

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26924 (3011426)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

Genetic engineering is a field of biotechnology that considers technologies for changing the composition of DNA at the junction of related disciplines: biology, biochemistry, genetics and virology. Genetic engineering allows you to "turn on" and "turn off" individual genes, thus controlling the activity of organisms, as well as transferring genetic instructions from one organism to another. The discipline considers the possibilities of applying genetics and molecular biology in medicine.

Purpose of studying of the discipline

formation at undergraduates of profound theoretical knowledge in the field of methods of genetic engineering as recent trend of biological science for use in practical activities.

Learning Outcomes

ON9 Explain the main mechanisms of heredity and variability; apply methods of statistical data analysis, forecasting and modeling of biological and environmental processes, including using modern information technologies. To argue the basic laws of individual and historical development of living organisms.

Prerequisites

Introduction to the Biology Teaching Profession

Postrequisites

Methods of solving problems in genetic

Flora and fauna of the world

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26927 (3011438)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The course examines the laws of the distribution of living organisms on the planet, the geographical aspects of flora and fauna, the structural and functional foundations of ecosystems. He also teaches the evolutionary development of living organisms in order to understand and explain their geographic distribution. Forms systematic knowledge of students about the flora and fauna of the environment, floristic, faunal, biotic migrations of the continent, modern zoning of the oceans, the main types of biomes.

Purpose of studying of the discipline

Formation of ideas about the diversity of plants and animals, their complexes on the surface of the globe, identification of causes and evolutionary trends in the dynamics of floras and faunas.

Learning Outcomes

ON 7 Possess knowledge about the resource value of plants in Kazakhstan; describe the diversity of the structure of cells, tissues and vegetative organs of various plant groups; evaluate the evolutionary significance of morphological structures of plants. To develop skills in the image of design and planning solutions for the construction of landscape compositions.

ON 8 Possess knowledge about the resource value of ichthyofauna, herpetofauna, ornithofauna and mammalian fauna. Describe the

biodiversity, ecological status and significance of the most important animal representatives of Kazakhstan.

Prerequisites

Plant Sistematic

Postrequisites

Bioresources Kazakhstan

Cytology and Histology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26928 (3011439)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The course examines the structure and functions of cells, intercellular substance, the laws of the body at the tissue level, the characteristics of tissues in different organs. Explains the mechanisms of adaptation of cells, tissues and organs to biological, physical, environmental, chemical and other factors. Develops students` ability to apply the basic physical, chemical, mathematical and other natural science concepts and methods in solving professional problems.

Purpose of studying of the discipline

Mastering by students of fundamental theoretical knowledge about the structural organization of life processes at the cellular, tissue and organ levels, revealing the patterns of their development and, in this regard, the possibility of purposeful influence on them.

Learning Outcomes

ON9 Explain the main mechanisms of heredity and variability; apply methods of statistical data analysis, forecasting and modeling of biological and environmental processes, including using modern information technologies. To argue the basic laws of individual and historical development of living organisms.

Prerequisites

Plant Sistematic

Postrequisites

Bioresources Kazakhstan

Cell biology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	27017 (3011458)
Course	3
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

Cell biology studies the structural organization and composition of plant and animal cells, intercellular matter; ultrastructure and functional features of cell organoids, their participation in the main metabolic processes: respiration, photosynthesis, transport of substances, protein biosynthesis based on light- optical, electron microscopy data. The discipline forms basic knowledge about the biology of the cell as an elementary structural unit of the living, about the main directions and prospects of using the achievements of cell biology in medicine.

Purpose of studying of the discipline

The purpose of the discipline is to study the structure of the cell and the mechanisms of metabolism at the molecular level.

Learning Outcomes

ON9 Explain the main mechanisms of heredity and variability; apply methods of statistical data analysis, forecasting and modeling of biological and environmental processes, including using modern information technologies. To argue the basic laws of individual and historical development of living organisms.

Prerequisites

Genetics

Postrequisites

Evolutionary Theory

Genetics and selection

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	27018 (3011459)
Course	3
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The course is aimed at studying the basic laws of heredity and variability, the cytological foundations of mono- and dihybrid crossing, the principles of transmission of heredity and variability in a number of generations, the main provisions of the chromosomal theory of heredity, general scientific and general biological methods in genetics, modern methods of genetics and breeding and their research to increase productivity and improve the quality of plant varieties and animal breeds.

Purpose of studying of the discipline

the formation of a system of views in the field of genetics and breeding.

Learning Outcomes

ON9 Explain the main mechanisms of heredity and variability; apply methods of statistical data analysis, forecasting and modeling of biological and environmental processes, including using modern information technologies. To argue the basic laws of individual and historical development of living organisms.

Prerequisites

Genetics

Postrequisites

Evolutionary Theory

Molecular Biology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	27019 (3011460)
Course	3
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The course of molecular biology is aimed at studying the functioning of living organisms from the point of view of the chemical structure of the molecules that make up them, the composition, structure of nucleic acids, mechanisms of DNA replication, transcription and RNA and translation of genetic information on ribosomes during protein biosynthesis. The discipline explains the molecular mechanisms of heredity and variability, the main metabolic processes in the cell and the transport of substances through biological membranes.

Purpose of studying of the discipline

To study the structure and main stages of cell activity, mechanisms of preservation and transmission of genetic information at the molecular level.

Learning Outcomes

ON9 Explain the main mechanisms of heredity and variability; apply methods of statistical data analysis, forecasting and modeling of biological and environmental processes, including using modern information technologies. To argue the basic laws of individual and historical development of living organisms.

Prerequisites

Genetics

Postrequisites

Evolutionary Theory

Biometrics

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27116 (3011448)
Course	4
Term	1

Credits count	6
Lections	15hours
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	40hours
Independent work of the student	80hours
Total	180hours
Knowledge control form	Examination

Short description of discipline
This course covers the theoretical foundations of statistical analysis of biological data, the theory of measurements and errors, modern methods of biological analysis. Teaches to determine the number of biological experiments carried out to solve the problems of analyzing data from a biological experimental study and to give accurate, correct conclusions on them using mathematical and statistical methods. Develops in students the ability to mathematically represent the results of a biometric study, to determine biometric indicators.

Purpose of studying of the discipline
Teaching students the basics of practical knowledge and skills in the field of biometrics and its relationship with other sciences, i.e. to master elementary methods of modern biometrics.

Learning Outcomes
ON9 Explain the main mechanisms of heredity and variability; apply methods of statistical data analysis, forecasting and modeling of biological and environmental processes, including using modern information technologies. To argue the basic laws of individual and historical development of living organisms.

Prerequisites
Big practicum in botany

Postrequisites
Landscape design

Bioresources Kazakhstan

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27118 (3011436)
Course	4
Term	1
Credits count	6
Lections	15hours
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	40hours
Independent work of the student	80hours
Total	180hours
Knowledge control form	Examination

Short description of discipline
This discipline provides knowledge about the biodiversity of the resources of plants and vertebrates of Kazakhstan, the stages of the history of the study of individual groups of useful species. During the development of the course, students form knowledge about medicinal, tannic, aromatic, technical valuable and popular raw plant resources, fish, amphibians, birds, mammals, the current state, as well as systematic knowledge about the methods of obtaining raw materials and methods of their application.

Purpose of studying of the discipline
in-depth study of the basic theories of animal and plant resources.

Learning Outcomes
ON 7 Possess knowledge about the resource value of plants in Kazakhstan; describe the diversity of the structure of cells, tissues and vegetative organs of various plant groups; evaluate the evolutionary significance of morphological structures of plants. To develop skills in the image of design and planning solutions for the construction of landscape compositions.
ON 8 Possess knowledge about the resource value of ichthyofauna, herpetofauna, ornithofauna and mammalian fauna. Describe the biodiversity, ecological status and significance of the most important animal representatives of Kazakhstan.

Prerequisites
Big practicum in botany

Postrequisites
Final examination

Biosphere - a global ecosystem

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27104 (3011485)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours

Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
A discipline that studies the life shell of the Earth as a global ecosystem unit. A necessary component of the global ecosystem is a complex cycle between living organisms and inanimate nature. Photosynthesis of autotrophs is considered an important process in the global ecosystem. The main trophic connections between organisms from the same food chain are also discussed. The problems of conservation of the biosphere and the role of man in nature are considered.

Purpose of studying of the discipline
To form future professionals an idea of the origin of life on Earth and the evolution of the biosphere, to explore the biosphere as a global environmental ecosystem.

Learning Outcomes
ON9 Explain the main mechanisms of heredity and variability; apply methods of statistical data analysis, forecasting and modeling of biological and environmental processes, including using modern information technologies. To argue the basic laws of individual and historical development of living organisms.
ON10 Demonstrate knowledge of theoretical disciplines and apply them in professional activities; consolidate the skills of independent planning and conducting research experiments.

Prerequisites
Big practicum in botany

Postrequisites
Final examination

Lichenology and briology

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27117 (3011437)
Course	4
Term	1
Credits count	6
Lections	15hours
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	40hours
Independent work of the student	80hours
Total	180hours
Knowledge control form	Examination

Short description of discipline
This course examines the species of lower plants and higher spore plants, including habitat, anatomical and morphological features, taxonomy of lichens and mosses. The range of lichens and mosses, the influence of anthropogenic factors and their protection, their place in the plant world have been studied. Allows students to regularly identify species and use them as ecological groups and local components.

Purpose of studying of the discipline
Formation of students` basic knowledge about the features of the structure and functioning of lichenized fungi (lichens) and mosses, their distribution, taxonomic groups and practical use possibilities.

Learning Outcomes
ON 7 Possess knowledge about the resource value of plants in Kazakhstan; describe the diversity of the structure of cells, tissues and vegetative organs of various plant groups; evaluate the evolutionary significance of morphological structures of plants. To develop skills in the image of design and planning solutions for the construction of landscape compositions.

Prerequisites
Big practicum in botany

Postrequisites
Final examination

Synthetic theory of evolution

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27119 (3011435)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours

Knowledge control form	Examination

Short description of discipline
This discipline provides for the study of the synthetic theory of evolution (STE), as well as modern evolutionary synthesis. When studying the course, students form systematic knowledge about Neolamarkism and its varieties (mechanolamarkism, ortholamarkism, psycholamarkism), about the creation and main provisions of the synthetic theory of evolution (STE), about variability and its role in evolution, about mutation as a material for the evolutionary process, about the works of evolutionists of the modern world, about modern problems of the criteria of the species, about the problems of human origin.

Purpose of studying of the discipline
Mastering the theory of evolution by students, developing their ability to independently analyze and synthesize complex material in modern biology.

Learning Outcomes
ON9 Explain the main mechanisms of heredity and variability; apply methods of statistical data analysis, forecasting and modeling of biological and environmental processes, including using modern information technologies. To argue the basic laws of individual and historical development of living organisms.
ON10 Demonstrate knowledge of theoretical disciplines and apply them in professional activities; consolidate the skills of independent planning and conducting research experiments.

Prerequisites
Big practicum in botany Microbiology with fundamentals of Virology

Postrequisites
Final examination

Modern problems of evolution

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27120 (3011434)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline provides for the study of the modern problem of evolution. When studying the course, students form systematic knowledge about artificial selection, the prerequisites and forms of the struggle for existence according to Darwin, about the main provisions of Darwin`s teachings. on the formation of adaptations according to Lamarck and Darwin and on the comparative analysis of Lamarck`s evolutionary concept and Darwin`s Evolutionary doctrine, on the relative nature of adaptations, on the history of the development of the concept of species, on the main levels of the organization of life and the evolutionary process, on the comparative analysis of natural and artificial selection

Purpose of studying of the discipline
Formation of dialectical-materialistic views of students, increasing the ability to biological thinking, explanation of cause-and-effect relationships of natural phenomena.

Learning Outcomes
ON9 Explain the main mechanisms of heredity and variability; apply methods of statistical data analysis, forecasting and modeling of biological and environmental processes, including using modern information technologies. To argue the basic laws of individual and historical development of living organisms.
ON10 Demonstrate knowledge of theoretical disciplines and apply them in professional activities; consolidate the skills of independent planning and conducting research experiments.

Prerequisites
Big practicum in botany Microbiology with fundamentals of Virology

Postrequisites
Final examination

The doctrine of the biosphere

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27110 (3011484)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours

Total	150hours
Knowledge control form	Examination

Short description of discipline
A discipline that studies the outer shell of the Earth, where life is widespread, and includes all living organisms and all elements of the bone nature. The doctrine of the biosphere is a comprehensive doctrine related to the main problems of conservation and morphogenesis of life on Earth. The biosphere and its study is a new approach to the study of the planet`s ecosphere as a developing and self-regulating ecosystem of the Earth

Purpose of studying of the discipline
To form an idea among future specialists about the formation of the Biosphere as the vital shell of the Earth

Learning Outcomes
ON9 Explain the main mechanisms of heredity and variability; apply methods of statistical data analysis, forecasting and modeling of biological and environmental processes, including using modern information technologies. To argue the basic laws of individual and historical development of living organisms.
ON10 Demonstrate knowledge of theoretical disciplines and apply them in professional activities; consolidate the skills of independent planning and conducting research experiments.

Prerequisites
Big practicum in botany

Postrequisites
Final examination

Evolutionary Theory

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27121 (3011433)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline studies the processes of formation of adaptations, factors determining the individual development of organisms and specific ways of historical development of individual groups of organisms and the organic world as a whole. When studying the course, students form a systematic knowledge of the methods of comparative anatomy, embryology and paleontology, triple parallelism, as well as the use of selection methods, biogeography to prove the evolutionary process, ecology, molecular biology and anthropology.

Purpose of studying of the discipline
To form a system of knowledge about general biological laws, laws, theories in the field of studying evolutionary teaching; to expand biological knowledge about evolutionary teaching; possession of scientific terminology, key concepts.

Learning Outcomes
ON9 Explain the main mechanisms of heredity and variability; apply methods of statistical data analysis, forecasting and modeling of biological and environmental processes, including using modern information technologies. To argue the basic laws of individual and historical development of living organisms.
ON10 Demonstrate knowledge of theoretical disciplines and apply them in professional activities; consolidate the skills of independent planning and conducting research experiments.

Prerequisites
Big practicum in botany Microbiology with fundamentals of Virology

Postrequisites
Final examination

The ecological function of soils in the biosphere and ecosystems

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27109 (3011486)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

A discipline that studies the ecological functions of soils and their significance for the earth`s biosphere. The importance of soils for the functioning of the biosphere is based on its following qualities. The soil is one of the habitats of life forms and is the most important link in the regulation of biogeochemical processes, cycles of organic and inorganic components that ensure the existence of life on Earth are carried out in it.

Purpose of studying of the discipline

the formation of fundamental knowledge about the living shell of the Earth - the soil, as a natural body, its properties, education, evolution.

Learning Outcomes

ON 7 Possess knowledge about the resource value of plants in Kazakhstan; describe the diversity of the structure of cells, tissues and vegetative organs of various plant groups; evaluate the evolutionary significance of morphological structures of plants. To develop skills in the image of design and planning solutions for the construction of landscape compositions.
ON10 Demonstrate knowledge of theoretical disciplines and apply them in professional activities; consolidate the skills of independent planning and conducting research experiments.

Prerequisites

Big practicum in botany

Postrequisites

Final examination

Undergraduate practice

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	27123 (3011441)
Course	4
Term	2
Credits count	15
Undergraduate practice	450hours
Total	450hours
Knowledge control form	Total mark on practice

Short description of discipline

Students` pre-graduate practice is designed to collect, process theoretical and practical material to complete the writing of a thesis (project). During the practice, students gain theoretical and practical skills on the topic of the thesis;
The tasks of the pre-graduate practice, its content are determined and specified depending on the specifics of the organization in which the student is practicing.

Purpose of studying of the discipline

collection and processing of theoretical and practical material necessary for the thesis.

Learning Outcomes

ON10 Demonstrate knowledge of theoretical disciplines and apply them in professional activities; consolidate the skills of independent planning and conducting research experiments.

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Final examination

Final examination

Writing and defending a thesis or preparing and passing a comprehensive exam

Graduate work

Credits count	8

Final examination

Credits count	8

4.Summary table on the scope of the educational program

«6B01510 - Biology»

Name of discipline	Cycle/ Component	Term	Number of credits	Total hours	Lec	SPL	LC	IWST	IWS	Knowledge control form
Module 1. Fundamentals of social and humanitarian knowledge										
Foreign language	GER/CC	1	5	150		45		35	70	Examination
Kazakh language	GER/CC	1	5	150		45		35	70	Examination
The module of socio-political knowledge (sociology, political science, cultural studies, psychology)	GER/CC	1	8	240	30	45		55	110	Examination
Russian language	GER/CC	1	5	150		45		35	70	Examination
Physical Culture	GER/CC	1	2	60		60				Differentiated attestation
Kazakh language	GER/CC	2	5	150		45		35	70	Examination
Foreign language	GER/CC	2	5	150		45		35	70	Examination
Bases of economics, law and ecological knowledge	GER/US	2	5	150	15	30		35	70	Examination
Russian language	GER/CC	2	5	150		45		35	70	Examination
Physical Culture	GER/CC	2	2	60		60				Differentiated attestation
History of Kazakhstan	GER/CC	3	5	150	30	15		35	70	Qualification examination
Physical Culture	GER/CC	3	2	60		60				Differentiated attestation
Information and communication technology	GER/CC	4	5	150	15	15	15	35	70	Examination
Physical Culture	GER/CC	4	2	60		60				Differentiated attestation
World of Abai	BS/US	4	3	90	15	15		20	40	Examination
Philosophy	GER/CC	6	5	150	15	30		35	70	Examination
Module 2. Psychological-pedagogical and methodological training of personnel										
Age psychology and physiology	BS/US	1	5	150	15	30		35	70	Examination
Pedagogy	BS/US	2	5	150	15	30		35	70	Examination
Inclusive education	BS/US	3	3	90	15	15		20	40	Examination
Pedagogical practice (psychological and pedagogical)	BS/US	4	2	60						Total mark on practice
Methodology of biology training	BS/CCh	5	5	150	15	30		35	70	Examination
Rules and principles of the content of the living corner	BS/CCh	5	5	150	15	30		35	70	Examination
Technologies of the updated content of education and criteria assessment	BS/US	5	5	150	15	30		35	70	Examination
Technology biology training in English	BS/CCh	5	5	150	15	30		35	70	Examination
Pedagogical practice	BS/CC	6	5	150						Total mark on practice

Production (pedagogical) practice	AS/CCh	8	15	450						Total mark on practice
Module 3. Fundamentals of Biology										
Introduction to the Biology Teaching Profession	BS/US	1	3	90	15	15		20	40	Examination
Anatomy and Morphology of Plants	BS/US	2	5	150	15	0	30	35	70	Examination
Biochemistry	BS/CCh	2	3	90	15	0	15	20	40	Examination
Inorganical chemistry	BS/CCh	2	3	90	15	0	15	20	40	Examination
General Chemistry	BS/CCh	2	3	90	15	0	15	20	40	Examination
Training practice	BS/US	2	2	60						Total mark on practice
Human anatomy	BS/CCh	3	5	150	15	30		35	70	Examination
Anatomy, the basics of sports morphology	BS/CCh	3	5	150	15	30		35	70	Examination
Geobotany	BS/CCh	3	5	150	15	0	30	35	70	Examination
Invertebrate Zoology	BS/CCh	3	5	150	15	0	30	35	70	Examination
Medicinal plants	BS/CCh	3	5	150	15	0	30	35	70	Examination
Parasitology	BS/CCh	3	5	150	15	0	30	35	70	Examination
Plant Sistematic	BS/CCh	3	5	150	15		30	35	70	Examination
Comparative anatomy of humans and animals	BS/CCh	3	5	150	15	30		35	70	Examination
Entomology	BS/CCh	3	5	150	15	0	30	35	70	Examination
Virology	AS/CCh	3	5	150	15	30		35	70	Examination
Microbiology	AS/CCh	3	5	150	15	30		35	70	Examination
Microbiology with fundamentals of Virology	AS/CCh	3	5	150	15	30		35	70	Examination
Vertebrate Zoology	BS/CCh	4	5	150	15	30		35	70	Examination
Ichthyology	BS/CCh	4	5	150	15	30		35	70	Examination
Ornithology	BS/CCh	4	5	150	15	30		35	70	Examination
Field training practice	BS/CC	4	2	60						Total mark on practice
Physiology of analyzers	BS/CCh	4	5	150	15		30	35	70	Examination
Human and animal physiology	BS/CCh	4	5	150	15		30	35	70	Examination
Ecological physiology of humans and animals	BS/CCh	4	5	150	15	0	30	35	70	Examination
Module 4. Innovative biological education										
Electronic educational resources	BS/US	5	5	150	15	30		35	70	Examination
Methods of organization of extracurricular work on the subject	BS/US	7	5	150	15	30		35	70	Examination
Methods of solving problems in genetic	AS/CCh	7	5	150		45		35	70	Examination
The organization of research work at the school	AS/CCh	7	5	150	0	45		35	70	Examination
Professional English in biology classes at school	AS/CCh	7	5	150	0	45		35	70	Examination
Form and methods of STEM education	AS/US	7	6	180	15	45		40	80	Examination

Module 5. Fundamentals of Applied Biology										
Big practicum in plant physiology	BS/CCh	4	5	150	15	30		35	70	Examination
Plant Physiology	BS/CCh	4	5	150	15		30	35	70	Examination
Physiology of growth and development of plants	BS/CCh	4	5	150	15	30		35	70	Examination
Applied Biology with the Basics of Soil Science	BS/CCh	5	5	150	15	30		35	70	Examination
Soil biology	BS/CCh	6	5	150	15	30		35	70	Examination
Plant biotechnology	BS/CCh	6	5	150	15	30		35	70	Examination
Indoor and decorative floriculture	BS/CCh	6	5	150	15	30		35	70	Examination
Organization works on the school grounds	BS/CCh	6	5	150	15	30		35	70	Examination
Ecology of plants	BS/CCh	6	5	150	15	30		35	70	Examination
Big practicum in botany	AS/CCh	6	5	150		15	30	35	70	Examination and term work/Project
Big practiccum in zoology	AS/CCh	6	5	150	0	15	30	35	70	Examination
Nature protection in Kazakhstan	AS/CCh	6	5	150		45		35	70	Examination and term work/Project
Taxonomy of animals	AS/CCh	6	5	150	0	15	30	35	70	Examination
Evolutionary adaptation of plants	AS/CCh	6	5	150		15	30	35	70	Examination
Animal ecology	AS/CCh	6	5	150	0	15	30	35	70	Examination
Plant biogeography	AS/CCh	7	5	150	15	30		35	70	Examination
Hydrobiology	AS/CCh	7	5	150	15	30		35	70	Examination
Landscape design	AS/CCh	7	5	150	15	30		35	70	Examination
Module 6. Genetics and evolution										
Animals and plants bielander	BS/CCh	5	5	150	15	30		35	70	Examination
Genetics	BS/CCh	5	5	150	15	30		35	70	Examination
Population genetics	BS/CCh	5	5	150	15	30		35	70	Examination
Genetic engineering	BS/CCh	5	5	150	15	30		35	70	Examination
Flora and fauna of the world	BS/CCh	5	5	150	15	30		35	70	Examination
Cytology and Histology	BS/CCh	5	5	150	15	30		35	70	Examination
Cell biology	BS/CCh	6	5	150	15	30		35	70	Examination
Genetics and selection	BS/CCh	6	5	150	15	30		35	70	Examination
Molecular Biology	BS/CCh	6	5	150	15	30		35	70	Examination
Biometrics	AS/CCh	7	6	180	15	45		40	80	Examination
Bioresources Kazakhstan	AS/CCh	7	6	180	15	45		40	80	Examination
Biosphere - a global ecosystem	AS/CCh	7	5	150	15	30		35	70	Examination

Lichenology and briology	AS/CCh	7	6	180	15	45		40	80	Examination
Synthetic theory of evolution	AS/CCh	7	5	150	15	30		35	70	Examination
Modern problems of evolution	AS/CCh	7	5	150	15	30		35	70	Examination
The doctrine of the biosphere	AS/CCh	7	5	150	15	30		35	70	Examination
Evolutionary Theory	AS/CCh	7	5	150	15	30		35	70	Examination
The ecological function of soils in the biosphere and ecosystems	AS/CCh	7	5	150	15	30		35	70	Examination
Undergraduate practice	AS/CCh	8	15	450						Total mark on practice
Final examination										
Graduate work		8	8	240						
Final examination		8	8	240						