NJSC SHAKARIM UNIVERSITY OF SEMEY

EDUCATIONAL PROGRAM

6B05 - Natural Sciences, Mathematics and Statistics
(Code and classifcation of the feld of education)

6B052 - Environment
(Code and classifcation of the direction of training)

0520
(Code in the International Standard Classifcation of Education)

B051 - The environment
(Code and classifcation of the educational program group)

6B05201 - Ecology
(Code and name of the educational program)

Bachelor
(Level of preparation)

Semey

Educational program

6B05 - Natural Sciences, Mathematics and Statistics
(Code and classification of the field of education)

6B052 - Environment
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6B05201 - Ecology
(Code and name of the educational program)

(Level of preparation)

Semey 2023

PREFACE

Developed

The educational program 6B05201 - Ecology in the direction of preparation 6B052 - Environment on the basis of the State Compulsory Standards of Higher and Postgraduate Education approved by the Order of the 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	Nurimkhan Gulnur	Dean of the Faculty of Engineering and Technology, candidate of technical sciences	
Educational program manager	Sarsenbayeva Gulmira	Senior Lecturer of the Department of Chemical Technology and Ecology	
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Member of the AC	Murzalimova Assel	Senior Lecturer of the Department of Chemical Technology and Ecology	
Member of the AC	Karatayev Askhat	Semey Cement Plant LLP. Head of the Department of Ecology	
Member of the AC	Samarkhanova Karlygash	EP 6B05201-Ecology, Student of the group EL-101	
Member of the AC	Tokkazinova Zhanara	EP 6B05201-Ecology, Student of the group EL-001	

Reviewing

Full name of the reviewer	Position, place of work	Signature
Butabayev Mamay	Deputy Head of the Ecology Department for the Abai region	

Reviewed

At the meeting of the Quality Assurance Commission of the Faculty of Engineering and Technology
Recommended for approval by the Academic Council of the University
Protocol №4/6, 10.04.2023
Chairman of the Commission on Quality Assurance Abdilova G.B.

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 Department of Chemical Technology and Ecology of the Faculty of Engineering and Technology of the NAO "Shakarim University of Semey" trains bachelors in the educational program 6B05201 - "Ecology". The educational program has been 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. The educational program is aimed at training specialists with knowledge in the field of environmental research, environmental protection, environmental management and environmental protection.

The educational program provides for the education of a student with special educational needs in the conditions of a higher educational institution, as well as his socialization and integration into society.

1.2.Completion criteria

The main criterion for the completion of the educational process for the preparation of bachelors is the mastering by students of at least 205 credits of theoretical training, as well as at least 27 credits of practical training, 8 credits of final certification.

A total of 240 credits.

1.3.Typical study duration: 4 years.

2.PASSPORT OF THE EDUCATIONAL PROGRAM

2.1.EP purpose	Preparation of bachelors of natural sciences with knowledge in the field of ecology and environmental protection, professionally skilled in the practical methods of modern environmental research, ensuring rational use of natural resources and environmental safety, satisfying the needs of the regional and national labor markets for qualified and competitive specialists.
2.2.Map of the training profile within the educational program	
Code and classification of the field of education	6B05 - Natural Sciences, Mathematics and Statistics
Code and classification of the direction of training	6B052 - Environment
Code in the International Standard Classification of Education	0520
Code and classification of the educational program group	B051 - The environment
Code and name of the educational program	6B05201 - Ecology
2.3.Qualification characteristics of the graduate	
Degree awarded / qualification	EDUCATIONAL PROGRAM (OP) 6B05201 Ecology
Name of the profession / list of positions of a specialist	ecologist by industry, teacher of secondary and professional educational institutions, inspector for environmental protection, environmental engineer, environmental laboratory assistant in research, primary and secondary vocational educational institutions
OQF qualification level (industry qualification framework)	6
Area of professional activity	natural and urbanized ecosystems and their components; biosphere and its components; environmental monitoring and marketing; analysis, inspection and control of the state of the environment; compilation of predictive models; management and consulting functions in the field of environmental protection; environmental education and upbringing; compliance with environmental requirements in technological processes and in the design of new enterprises, settlements, planning and implementation of environmental protection measures in various spheres of the economy, conducting an EIA and environmental audit.
Object of professional activity	territorial departments of environmental protection, national parks, reserves, wildlife reserves, biosphere reserves, industrial enterprises, agro-industrial complexes, landfills, energy facilities, nuclear power plants, educational organizations, research institutes and centers.
Types of professional activity	"Conservation and restoration of biodiversity of the natural environment" can be performed by the following types of professional activities: - organizational and managerial; - production and technological; - service and operational; - research; - educational and upbringing (pedagogical);

	design.
Graduate Model	The graduate model of EP 6B05201-Ecology represents a complete set of learning outcomes and personal qualities and guarantees the success of professional competencies of a graduate who is able to search, critically analyze and synthesize information, apply a systematic approach to solving tasks focused on the formation of special competencies in accordance with professional standards, taking into account the requests of employers.

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	30098 (3013169)
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`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 pan-European competence, if the language level of the student at the start is higher than the level B1 of the pan-European competence.

Learning Outcomes

ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society.

Prerequisites

School course

Postrequisites

Foreign language

Kazakh language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	30366 (3013173)
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

ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society.

Prerequisites

School course

Postrequisites

Kazakh language

Bases of economics, law and ecological knowledge

Discipline cycle	General educational disciplines

Discipline component	University component
SubjectID	30097 (3013261)
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 integrated discipline 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 the business, ethical, social, economic, entrepreneurial and environmental standards of society. Specifics of environmental-legal, economic, entrepreneurial relations, leadership qualities and principles of combating 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

ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current 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	30365 (3013172)
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

ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society.

Prerequisites

School course

Postrequisites

Russian language

Physical Culture

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	27243 (3013165)

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
ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society.

Prerequisites
School course

Postrequisites
Physical Culture

Kazakh language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	30371 (3013174)
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
ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current 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	30368 (3013170)
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 pan-European competence, if the language level of the student at the start is higher than the level B1 of the pan-European competence.

Learning Outcomes

ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society.

Prerequisites

Foreign language

Postrequisites

Basic and profile disciplines of the EP

History of Kazakhstan

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	30380 (3013257)
Course	1
Term	2
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

ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society.

Prerequisites

School course

Postrequisites

Philosophy

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

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	30385 (3013259)
Course	1
Term	2
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

ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society.

Prerequisites

School course

Postrequisites

Philosophy

Russian language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	30369 (3013171)
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

ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current 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	30367 (3013166)
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

ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society.

Prerequisites

Physical Culture

Postrequisites
Physical Culture

Physical Culture

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	30399 (3013168)
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
ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society.

Prerequisites
Physical Culture

Postrequisites
Physical Culture

World of Abai

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	30596 (3013247)
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
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
ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current 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

Information and communication technology

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	30586 (3013260)
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
ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society.

Prerequisites
School course Foreign language

Postrequisites
Basic and profile disciplines of the EP

Physical Culture

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	30584 (3013167)
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
ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society.

Prerequisites
Physical Culture

Postrequisites
Basic and profile disciplines of the EP

Philosophy

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	30582 (3013177)
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 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

ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technologies taking into account current trends in the development of society.

Prerequisites

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

Postrequisites

Basic and profile disciplines of the EP

Module 2. Fundamentals of professional knowledge

Introduction to Specialty

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	28965 (3013240)
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

The discipline is aimed at revealing the basic concepts of ecology, its complexity, the huge role of environmental knowledge in the science and practice of various aspects of modern society, the patterns of relationships between organisms and their habitat, consideration of the essence, causes of global environmental problems and ways to solve these problems. The problems, methods and sections of the science "Ecology" with various aspects of the professional activity of an ecologist are considered.

Purpose of studying of the discipline

To provide information about the modern role and importance of ecology, to reveal the patterns of interaction of living organisms and their habitat

Learning Outcomes

ON2 Possess the basics of professional knowledge, methods of scientific research used in ecology, generalize the results obtained taking into account the experience previously accumulated in science.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites

Biological ecology

Postrequisites

Quality management and control environment

Origin and Evolution of the Biosphere

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30093 (3013232)
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

The discipline is aimed at studying the origin and evolution of the biosphere as a global ecosystem. The course examines the distinctive properties of life, the problem and the main theories of the origin of life, the peculiarities of the development of the plant and animal world at different stages of the evolution of the biosphere. The concept of the biosphere by V.I. Vernadsky is studied. Atmospheric and hydrospheric global processes are characterized. The regularities of the functioning of the biosphere and the mechanisms that ensure its

stability at the present stage are described

Purpose of studying of the discipline

To give a complete picture of the biosphere as the largest terrestrial ecosystem and its evolution, to outline the boundaries of the biosphere, to identify the scale, unity and patterns of global biosphere processes, human contribution to changing their pace, indicating current and potential consequences for the biosphere.

Learning Outcomes

ON2 Possess the basics of professional knowledge, methods of scientific research used in ecology, generalize the results obtained taking into account the experience previously accumulated in science.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites

Biological ecology

Postrequisites

Quality management and control environment

Environmental aspects of natural philosophy

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30094 (3013241)
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 course examines the ecological foundations of natural science, the biological efficiency of communities and ecosystems. The knowledge of the state of natural ecosystems, the processes of the mechanisms of environmental harmfulness and the production of anthropogenic factors for human health, as well as the factors of the influence of dangerous, environmentally harmful substances into the environment that lead to a change in the current or relaxed state of the habitat are studied

Purpose of studying of the discipline

Formation of systematized knowledge in the field of the ecological aspect of natural science on aspects of the theory and methodology of the organization of environmental education and upbringing, as well as in accordance with the latest scientific data on the problems of environmental management.

Learning Outcomes

ON2 Possess the basics of professional knowledge, methods of scientific research used in ecology, generalize the results obtained taking into account the experience previously accumulated in science.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites

Biological ecology

Postrequisites

Quality management and control environment

Educational practice

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	30102 (3013233)
Course	1
Term	2
Credits count	2
Study practics	60hours
Total	60hours
Knowledge control form	Total mark on practice

Short description of discipline

Educational practice is considered as a direct continuation of classroom classes. Theoretical knowledge, practical skills and skills acquired by students in the study of first- year disciplines are formed. Local objects of study are enterprises, institutions and organizations of production spheres. This practice also allows you to acquire new professionally- oriented knowledge in the field of ecology, striving for self-development, professional development and mastery.

Purpose of studying of the discipline

the deepening of the theoretical training of the student

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.

ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.

Prerequisites

Origin and Evolution of the Biosphere

Postrequisites

Production practice I

Environmental resource studies

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	30113 (3013212)
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

The discipline is aimed at studying the location and structure of certain types of natural resources and their complexes, issues of their protection, reproduction, economic assessment, rational use and resource availability. The most important types of natural resources, opportunities and ways of economic use of natural resources, their distribution and condition are described. Ideas are given about the environmental consequences of the placement of certain types of natural resources and resource conservation and resource production.

Purpose of studying of the discipline

Formation of the main provisions of the strategy and tactics of assessing the compliance of natural resources with the current level of consumption and rational use, taking into account environmental consequences, theoretical and practical knowledge about natural resources, developed and the prospects for the development of the natural resource potential of the Republic of Kazakhstan.

Learning Outcomes

ON2 Possess the basics of professional knowledge, methods of scientific research used in ecology, generalize the results obtained taking into account the experience previously accumulated in science.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites

Pedology

Postrequisites

Geoecology

Elementary System Ecology

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	30121 (3013243)
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

The discipline is aimed at studying the theoretical and methodological foundations of systemic ecology. This course examines the methodology of system analysis; a general idea of systems; the system organization of the surrounding world; ecosystem and geoecosystem as a set of interrelated components; models and modeling, modeling capabilities of ecosystems and geosystems; stages and scientific and practical capabilities of ecosystem and geosystems analysis; fundamentals of forecasting in ecology from a systemic perspective.

Purpose of studying of the discipline

discipline:summarize the Knowing of ecology based on a systematic approach to theoretical questions of general ecology and the application of systems analysis to environmental issues, give the same positions characteristic of all major components of ecosystems, to describe their relationship with each other and with the environment

Learning Outcomes

ON2 Possess the basics of professional knowledge, methods of scientific research used in ecology, generalize the results obtained taking into account the experience previously accumulated in science.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural

environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites

Protection of terrestrial and aquatic ecosystems

Postrequisites

Final examination

Research Methods of Ecology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30136 (3013184)
Course	3
Term	1
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 studying the research work of students in higher education. As part of the course, students learn to work with scientific literature, choose directions, problems, and topics of scientific research. Their methodological foundations of scientific knowledge and creativity are being developed. The methods of empirical and theoretical research, stages and directions of scientific research are considered. The characteristics of fundamental, applied and exploratory research are given

Purpose of studying of the discipline

The purpose of studying the discipline: training of specialists with high general scientific and professional training, capable of independent creative work, having an idea of methodological patterns common to all sciences.

Learning Outcomes

ON2 Possess the basics of professional knowledge, methods of scientific research used in ecology, generalize the results obtained taking into account the experience previously accumulated in science.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites

Introduction to Specialty

Postrequisites

Development of environmental projects

Nature conservation and rational use of natural resources

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30146 (3013215)
Course	3
Term	1
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 devoted to the study of the history of human interaction with the environment and the stages of development. The main modern problems of the environment, trends of their changes, prospects for solving global problems in ecology are considered. The methods of environmental assessment, protection of natural resources, the main legislative documents in the field of nature protection and rational use of natural resources are being studied, a system of environmental protection measures is being implemented

Purpose of studying of the discipline

Formation of basic knowledge related to the development of the study of the human environment and nature with the protection and use of resources and natural conditions

Learning Outcomes

ON2 Possess the basics of professional knowledge, methods of scientific research used in ecology, generalize the results obtained taking into account the experience previously accumulated in science.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites

Introduction to Specialty

Postrequisites

Development of environmental projects

Agricultural ecology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30150 (3013244)
Course	3
Term	1
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

This course studies agroecosystems, technogenic pollution of soil- biotic complexes, rational use of soil and water resources, environmental problems of chemicalization and agricultural radiology, agroecomonitoring, optimization of agricultural landscapes, production of environmentally safe agricultural products, environmental protection activities in agriculture. Innovative and technical solutions are being formed for the rational use of the potential of soil, plants and animals in the production of agricultural products

Purpose of studying of the discipline

To form ideas, theoretical knowledge, practical skills and abilities about the laws and features of the functioning of agricultural ecosystems in the general system of cenoses and the biosphere as a whole, environmental problems of agriculture

Learning Outcomes

ON2 Possess the basics of professional knowledge, methods of scientific research used in ecology, generalize the results obtained taking into account the experience previously accumulated in science.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites

Introduction to Specialty

Postrequisites

Development of environmental projects

Module 3. Natural Science

Pedology

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	30106 (3013213)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Laboratory works	0hours
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 mainly devoted to the patterns of geographical distribution of soils, the influence of soils on their development, education and environmental factors aimed at improving the ways of their effective use by soils. The structure and composition of soils, their properties and patterns of geographical distribution are used in the study of the processes of formation, development on earth, the influence of environmental factors on soil formation and its place in nature, ways of its effective use and improvement.

Purpose of studying of the discipline

To show the functioning of the soil as a complex independent subsystem in the system of biogeocenosis and higher-level systems, as well as the formation of knowledge about soil ecology, the study of the ecological functions of the soil cover.

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.

Prerequisites

Biological ecology

Postrequisites

Environmental resource studies

Chemistry

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	30112 (3013238)
Course	2
Term	1
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 studying the basic concepts and laws of chemistry, classical and quantum-mechanical ideas about the structure of the atom and chemical bonds; consideration of periodic laws and structure of the periodic system of chemical elements, types of chemical bonds; mastering the laws of thermodynamics, chemical kinetics and chemical equilibrium, corrosion of metals, ways of expressing the concentration of solutions; promote the ability to apply the knowledge gained in practice, to solve problems in professional training.

Purpose of studying of the discipline

Familiarization of students with modern ideas about the structure of substances, with the basic theories of chemical processes, with the properties of catalytic and complex systems, as well as with the properties of elements. Knowledge of the basic theory of chemical processes necessary in the study and deeper understanding of all subsequent special disciplines, also give students scientific and practical training in the basics of analytical chemistry.

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.

Prerequisites

School course

Postrequisites

Environmental chemistry

Environmental chemistry

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	30110 (3013231)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Laboratory works	0hours
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 studying environmental chemistry as a scientific direction. Chemical processes occurring in environmental objects are considered; the main groups of chemical pollutants (heavy metals, dioxins, etc.); the transformation of xenobiotics after entering the natural environment. The main geospheres of the Earth are characterized; chemical pollution of the atmosphere, hydrosphere and lithosphere. The specifics of chemical monitoring methods, as well as chemical principles of environmental management and control are described.

Purpose of studying of the discipline

Familiarization of students with the scientific and methodological foundations of studying the chemical aspects of the influence of human activity on natural objects, on the processes occurring in the air, water and soil when pollutants enter and the possibility of preventing environmental pollution; studying the transformation of chemical compounds in the environment, forecasting the possible consequences of such changes and the formation of decision-making skills taking into account environmental requirements.

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge

and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.

Prerequisites

Chemistry

Postrequisites

Biogeochemistry and Ecotoxicology

Radiation ecology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30147 (3013228)
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 is aimed at studying the history of the origin and development of radiation ecology, tasks and directions of modern radiation research. In this course, radioactivity is considered as a physical factor of the environment, radiation sources and units of measurement of radioactivity are described. The features of radiation pollution of natural objects and the effects of ionizing radiation on living organisms are characterized. The characteristics of radioactive waste are given, methods of their processing, disposal and burial are studied.

Purpose of studying of the discipline

to give students basic knowledge about the essence of radioecology, its tasks, the impact of radioactive radiation on all living organisms, as well as ways to protect the environment and solve modern radioecological problems,
to give students basic knowledge

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.

Prerequisites

Chemistry

Postrequisites

Topical issues of radioecology of Kazakhstan

Radiation Safety Basic

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30148 (3013229)
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 is aimed at studying the history of the origin and development of radiation ecology, tasks and directions of modern radiation research. In this course, radioactivity is considered as a physical factor of the environment, radiation sources and units of measurement of radioactivity are described. The features of radiation pollution of natural objects and the effects of ionizing radiation on living organisms are characterized. The characteristics of radioactive waste are given, methods of their processing, disposal and burial are studied.

Purpose of studying of the discipline

Theoretical and practical training of students on radiation safety, ensuring safe work with ionizing radiation sources, their dosimetry and control.

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.

ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.

Prerequisites

Chemistry

Postrequisites

Topical issues of radioecology of Kazakhstan

Radiological RK problems

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30149 (3013230)
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 is aimed at studying radioecological problems of the Republic of Kazakhstan. The course deals with the problems associated with the extraction of uranium, describes the technology of its underground leaching. The current radioecological condition of the former Semipalatinsk test site and measures to return its lands to economic use are evaluated. Measures for the safe termination of the activities of nuclear power facilities are described on the example of the BN-350 reactor.

Purpose of studying of the discipline

Mastering knowledge about the nature of ionizing radiation, the effects of radiation on living organisms, the current radioecological situation in the Republic of Kazakhstan and ways to overcome modern radioecological problems of the country.

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.

Prerequisites

Chemistry

Postrequisites

Topical issues of radioecology of Kazakhstan

Biogeochemistry and Ecotoxicology

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	30126 (3013203)
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 studying the theoretical foundations of biogeochemistry and ecotoxicology. This course examines the formation and development of biogeochemistry; the origin and evolution of the main outer shells of the Earth; biogeochemical cycles of chemical elements, as well as the purpose and main objectives of environmental toxicology; the influence of the structure of a substance on its degree of toxicity; methods of studying toxicants and the practical significance of ecotoxicology.

Purpose of studying of the discipline

Teaching the basics of biogeochemistry and ecotoxicology – the processes of migration and mass exchange of chemical elements between living organisms and the environment; studying the effect of toxic compounds on ecosystems and the biological adaptability of living organisms to toxic effects.

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.

Prerequisites

Environmental chemistry

Postrequisites

Bases of ecological rationing and examination

Module 4. Biological

Biological ecology

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	30447 (3013227)
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 discipline is aimed at studying the living conditions of organisms and the relationship between organisms and the environment. The regularities determining the interaction of living organisms with the environment are taken into account. The distribution and dynamics of the number of organisms and communities, energy flows through the circulation of living systems and substances, biological productivity of communities and ecosystems are studied. The course is designed to preserve natural ecosystems

Purpose of studying of the discipline

Ecologization of students` consciousness and fostering a sense of responsibility for the surrounding nature. Knowledge of the basic laws of interaction of the components of the biosphere and the consequences of interference of human economic activity, especially in the conditions of intensification of environmental management, is necessary to solve practical problems in the plane of the relationship between society and the biosphere as a whole.

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON11 To monitor compliance with environmental legislation, standards and regulations on environmental protection and rational use of natural resources, preservation of the state nature reserve fund and natural ecological systems.

Prerequisites

School course

Postrequisites

Bioindicative methods of research

Forest protection

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30095 (3013248)
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

The discipline is aimed at studying the features of forest ecosystems, their distribution and diversity. A set of measures for the protection and restoration of forests is described. The causes of forest fires, their types, methods of prevention are considered. The ideas about regional forest communities and the patterns of their development are given on the example of the ribbon pine forest of the Irtysh region, the issues of reforestation and the organization of forest nurseries are considered.

Purpose of studying of the discipline

study of the features of forest ecosystems and regional forest communities

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.

ON11 To monitor compliance with environmental legislation, standards and regulations on environmental protection and rational use of natural resources, preservation of the state nature reserve fund and natural ecological systems.

Prerequisites

School course

Postrequisites

Ecological biogeography

Ecology of animals

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26902 (3013225)
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

The discipline is aimed at studying information about the most important ecological features of representatives of the animal kingdom, their main ecological characteristics and classifications. The features of gas exchange and heat exchange of animals, the role of ambient temperature in animal life, animal biorhythms, regulation of their numbers, hunting and fishing management are considered. The role of animal organisms in the natural balance, the influence of anthropogenic factors on the vital activity of animals is considered.

Purpose of studying of the discipline

Considering the factual ecology of animals and the habitat of animals, to study their characteristics and structure.

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON11 To monitor compliance with environmental legislation, standards and regulations on environmental protection and rational use of natural resources, preservation of the state nature reserve fund and natural ecological systems.

Prerequisites

School course

Postrequisites

Ecological biogeography

Ecology of animals and plants

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30091 (3013226)
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

The discipline is aimed at studying information about the most important ecological features of representatives of the animal and plant kingdom, their main ecological characteristics and classifications. The features of gas exchange and heat exchange of animals, the role of ambient temperature in animal life, animal biorhythms, regulation of their numbers, hunting and fishing management are considered. It characterizes the importance of air, heat, water and light in plant life, heat as necessary conditions for the existence of plants.

Purpose of studying of the discipline

To provide students with information about the most important ecological features of representatives of the animal and plant kingdom, to study their main ecological characteristics and classifications.

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON11 To monitor compliance with environmental legislation, standards and regulations on environmental protection and rational use of

natural resources, preservation of the state nature reserve fund and natural ecological systems.

Prerequisites

School course

Postrequisites

Ecological biogeography

Bioindicative methods of research

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30100 (3013222)
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 aimed at studying the tasks, methods and principles of the application of bioindication in the assessment of the state of the environment. Bioindication reactions at different levels of the organization of living things are considered, including the use of microorganisms to assess the state of natural objects, the use of bioindication methods for plant research, as well as the advantages of invertebrates and the possibility of using vertebrates in bioindication. The comparison of bioindication research methods with physico-chemical methods is carried out.

Purpose of studying of the discipline

To study general approaches and methods of bioindication, as well as to teach to analyze the quality of natural habitats based on the assessment of the state of living organisms and their communities living in them.

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON11 To monitor compliance with environmental legislation, standards and regulations on environmental protection and rational use of natural resources, preservation of the state nature reserve fund and natural ecological systems.

Prerequisites

Biological ecology

Postrequisites

Environmental monitoring and environmental quality controls

Biological levels of impact of pollution of the biosphere

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30101 (3013223)
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 aimed at studying the main types of pollution of the global ecosystem – the biosphere and the specific features of their impact on different levels of organization of living organisms. This course describes the biological levels of organization of living organisms, examines the features of reactions to environmental pollution of representatives of lower and higher hierarchical systems, uses a systematic analysis of complex ecological systems.

Purpose of studying of the discipline

types of biological pollution and their influence on other processes in the biosphere are considered

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON11 To monitor compliance with environmental legislation, standards and regulations on environmental protection and rational use of

natural resources, preservation of the state nature reserve fund and natural ecological systems.

Prerequisites

Biological ecology

Postrequisites

Environmental monitoring and environmental quality controls

Biotecting of urban areas

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30099 (3013221)
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 aimed at studying biotesting as a method of assessing the toxicity of the environment using test objects. This course describes the specifics of urban ecosystems, the main sources of pollution of urban environmental objects and bioindication methods for determining pollution of urbanized territories. The possibilities of such test systems as microorganisms, plants and animals, as well as cell culture are characterized in detail for the detection of ecotoxicants. The requirements for the characteristic features of test objects are considered

Purpose of studying of the discipline

Familiarization of students with the methodological foundations of biological monitoring of the state of urbanized territories by the main methods of biotesting.

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON11 To monitor compliance with environmental legislation, standards and regulations on environmental protection and rational use of natural resources, preservation of the state nature reserve fund and natural ecological systems.

Prerequisites

Biological ecology

Postrequisites

Environmental monitoring and environmental quality controls

Protection of land ecosystems

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30108 (3013219)
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 discipline is aimed at studying the ecological principles of terrestrial ecosystems, ecosystems of the Earth (polar deserts, tundra and forest tundra; coniferous forests; deciduous forests; temperate steppes; deserts: grasses and shrubs; mountains), their classification, features and protection. The climatic zones of Kazakhstan and the environmental foundations of terrestrial ecosystems of the biosphere are considered. The course introduces the legal foundations of the protection of terrestrial ecosystems, the priorities of conservation of the nature reserve fund and natural ecological systems

Purpose of studying of the discipline

Know the characteristics and problems of protecting terrestrial ecosystems.. An urgent problem of environmental protection and natural resources is the protection of ecosystems on land and in water. To familiarize students with the types of environmental activities, the system of norms and rules, regulatory documentation, design, environmental protection, rational use of natural resources, environmental safety, as well as environmental expertise, audit and EIA.

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge

and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON11 To monitor compliance with environmental legislation, standards and regulations on environmental protection and rational use of natural resources, preservation of the state nature reserve fund and natural ecological systems.

Prerequisites
Introduction to Specialty

Postrequisites
Elementary System Ecology

Basis of Biochymistry

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30111 (3013234)
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 discipline is aimed at studying the chemical structure and transformation of molecules that make up living matter, i.e. studies the chemical foundations of life processes. Introduces future specialists to the structure and properties of chemical compounds that make up the human body. Allows you to master theoretical knowledge in the main sections of biochemistry, the skills of setting up biochemical research, the ability to apply the theoretical knowledge and practical skills in professional activities.

Purpose of studying of the discipline
the study methodology for establishing the major structures of biomolecules, secondary metabolites

Learning Outcomes
ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON11 To monitor compliance with environmental legislation, standards and regulations on environmental protection and rational use of natural resources, preservation of the state nature reserve fund and natural ecological systems.

Prerequisites
Introduction to Specialty

Postrequisites
Elementary System Ecology

Protection of terrestrial and aquatic ecosystems

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30109 (3013220)
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 discipline is aimed at studying the ecological principles of terrestrial and aquatic ecosystems, ecosystems of the Earth (polar deserts, tundra and forest tundra; coniferous forests; broad-leaved forests; temperate steppes; deserts: grasses and shrubs; mountains), their classification, features and protection. Freshwater ecosystems (artificial, natural freshwater and marine ecosystems) and their protection, land and water ecosystems, as well as climatic zones of Kazakhstan are considered.

Purpose of studying of the discipline
Study of the problem of conservation of terrestrial and aquatic ecosystems, their flora and fauna.

Learning Outcomes
ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological

ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON11 To monitor compliance with environmental legislation, standards and regulations on environmental protection and rational use of natural resources, preservation of the state nature reserve fund and natural ecological systems.

Prerequisites

Introduction to Specialty

Postrequisites

Elementary System Ecology

Theory and practice of nature conservation in the RK

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30117 (3013217)
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

The discipline is aimed at studying the system of specially protected natural territories (protected areas) of different countries. The course examines the distribution of protected areas by countries and regions of the world, studies protected areas of global, regional and local levels, the peculiarities of their protection regimes, as well as issues of ecological tourism in protected areas, including Kazakhstan (for example, Bayan-Aul State National Natural Park, Shchuchinsko-Borovskaya resort area, etc.).

Purpose of studying of the discipline

To study the theoretical and practical aspects of nature conservation in the Republic of Kazakhstan, as well as issues of creation, strengthening, functioning and development of specially protected natural areas (protected areas), primarily state nature reserves.

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON11 To monitor compliance with environmental legislation, standards and regulations on environmental protection and rational use of natural resources, preservation of the state nature reserve fund and natural ecological systems.

Prerequisites

Protection of terrestrial and aquatic ecosystems

Postrequisites

Ecology of Kazakhstan

Biogeography with fundamentals of ecology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30119 (3013224)
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

The discipline is aimed at studying the unity of the organic world of the planet, the relationship of its flora and fauna, as well as the dependence of vegetation and animal population on factors of the physical and geographical environment and human influence. The history of the development of biogeography, its basic concepts, sections, the biosphere and the circulation of substances, the basic principles of the structure and structure of the ecosystem are considered. Environmental factors are characterized: climatic, biotic, anthropogenic.

Purpose of studying of the discipline

To form students` stable knowledge about the basic provisions and principles of ecology and biogeography, the patterns of geographical distribution of living organisms and their communities; to form the skills of applying the acquired knowledge in the field of nature conservation and nature management

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge

and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON11 To monitor compliance with environmental legislation, standards and regulations on environmental protection and rational use of natural resources, preservation of the state nature reserve fund and natural ecological systems.

Prerequisites

Ecology of animals and plants

Postrequisites

Geoecology

Reserved matter in RK

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30118 (3013218)
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

The discipline is aimed at studying the history of development, formation, and the current state of the nature reserve business of Kazakhstan. The article considers the biodiversity of the Republic of Kazakhstan and the problem of its conservation; the concept of specially protected natural territories (protected areas); types of protected areas of Kazakhstan, their composition, area; goals, objectives and history of the creation of reserves and national natural parks, characteristics of their flora and fauna. The activities of other types of protected areas of the Republic of Kazakhstan are briefly described.

Purpose of studying of the discipline

To give Knowing of the existing especially protected natural territories in RK and methods of management over them.

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON11 To monitor compliance with environmental legislation, standards and regulations on environmental protection and rational use of natural resources, preservation of the state nature reserve fund and natural ecological systems.

Prerequisites

Protection of terrestrial and aquatic ecosystems

Postrequisites

Ecology of Kazakhstan

Protection of a plant and animal life

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30115 (3013216)
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

The discipline is aimed at studying methods and methods of plant and animal protection. The course examines the purpose, objectives and subject of the discipline, the concept of "nature protection", the main objectives of environmental protection activities, the legislative and regulatory framework of environmental protection activities. Specially protected natural territories are characterized as the basis for the sustainable existence of natural communities. The features of the protection of flora and fauna in the Republic of Kazakhstan are described.

Purpose of studying of the discipline

Formation of students` ideas about modern problems of biodiversity conservation on Earth, methods and principles of protection of flora and fauna.

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON11 To monitor compliance with environmental legislation, standards and regulations on environmental protection and rational use of natural resources, preservation of the state nature reserve fund and natural ecological systems.

Prerequisites
Protection of terrestrial and aquatic ecosystems

Postrequisites
Ecology of Kazakhstan

Production practice I

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	30120 (3013235)
Course	2
Term	2
Credits count	5
Working practice	150hours
Total	150hours
Knowledge control form	Total mark on practice

Short description of discipline
The industrial practice of I students is aimed at training highly qualified specialists, at acquiring practical skills and professional competencies in the experience of professional activity. As part of the practice, students study the work of environmental protection departments; environmental protection measures carried out at the enterprise; methods of economic stimulation of environmental protection activities of the enterprise, assessment of the level of environmental sustainability to the anthropogenic load of this territory.

Purpose of studying of the discipline
Purpose of studying of the discipline: this consolidation and deepening of theoretical knowledge gained during the educational process, as well as the acquisition of practical skills for their application

Learning Outcomes
ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON11 To monitor compliance with environmental legislation, standards and regulations on environmental protection and rational use of natural resources, preservation of the state nature reserve fund and natural ecological systems.

Prerequisites
Educational practice

Postrequisites
Production practice II

Ecological biogeography

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30114 (3013214)
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
The discipline is aimed at studying the history of the development of biogeography and the emergence of ecological biogeography. The principles of the structure and structure of the ecosystem are considered; the concept of the area and features of the distribution of organisms on the planet. Floristic (Holarctic and Cape kingdoms) and faunal zoning (kingdoms of Paleogee, Arctogee, Neogee, Notogee) are studied. The types of anthropogenic impact on organisms are described, as well as the transition from species protection to community protection as a new vector of biodiversity conservation.

Purpose of studying of the discipline
To show the unity of the organic world of the planet, the interrelation of its flora and fauna, as well as the dependence of vegetation and animal population on the factors of the physical and geographical environment and human impact.

Learning Outcomes
ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological

ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON11 To monitor compliance with environmental legislation, standards and regulations on environmental protection and rational use of natural resources, preservation of the state nature reserve fund and natural ecological systems.

Prerequisites

Ecology of animals and plants

Postrequisites

Geoecology

Ecological foundations of biodiversity

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30122 (3013245)
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

The discipline is aimed at studying the ecological foundations of the diversity of flora and fauna. The course examines the structure and basic patterns of the formation of biological diversity of different ecological systems. The role of biological diversity in ecosystems is demonstrated, as well as its economic importance. The biodiversity of individual ecosystems and regions is assessed. The fundamentals of environmental management for the conservation and maintenance of biological diversity are described.

Purpose of studying of the discipline

formation of ideas about the ecological features of different groups of living organisms and their communities, basic environmental laws and environmental problems; development of skills in collecting and processing field materials;
knowledge of the skills of identification and description of biological diversity; development of assessment skills by modern methods of quantitative information processing and analysis of the obtained materials; knowledge of the biological foundations of ecology and nature management understanding of the interdependence of phenomena and processes in wildlife, to identify and correctly interpret the observed reactions of organisms, populations and communities to environmental factors,

Learning Outcomes

ON3 Systematize the basic laws of the fundamental disciplines of the natural science cycle, possess professionally oriented knowledge and practical skills in the field of chemistry, biogeochemistry, ecotoxicology, soil science, biogeography with their use in ecology.
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON11 To monitor compliance with environmental legislation, standards and regulations on environmental protection and rational use of natural resources, preservation of the state nature reserve fund and natural ecological systems.

Prerequisites

Ecology of animals and plants

Postrequisites

Geoecology

Module 5. Environmental -monitoring

Production practice II

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	30127 (3013236)
Course	3
Term	2
Credits count	5
Working practice II	150hours
Total	150hours
Knowledge control form	Total mark on practice

Short description of discipline

This production practice 2 is aimed at mastering the skills of creating and implementing an environmental monitoring program and system in anthropogenic impact zones. Considers the development of effective measures to prevent or take prompt and competent decisions to reduce pollution of environmental objects. Independently determine the tasks of professional and personal development, engage in self-education, consciously plan professional development in the field of industrial ecology.

Purpose of studying of the discipline

training are to consolidate and deepen the theoretical training of the student and to acquire practical skills and competences in the field of professional activity, purposeful and active work of the student in collecting the necessary material for the coursework.

Learning Outcomes

ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological

ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON7 Create and implement environmental monitoring programs and systems in areas of anthropogenic impact, develop effective prevention measures or take prompt and competent decisions to reduce pollution of environmental objects.

Prerequisites
Production practice I

Postrequisites
Prediploma practice

Quality management and control environment

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	30128 (3013250)
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
This course examines the development of theoretical foundations and regulatory documents on environmental quality assurance, the formation of knowledge, skills and skills in the use of management technologies in the field of environmental protection, familiarity with modern methods of ecological and economic analysis of the enterprise used in environmental management and water use. Students develop a willingness to use modern management tools and mechanisms aimed at reducing environmental pollution from economic entities.

Purpose of studying of the discipline
formation of students` skills in assessing the state of natural and man-made objects to justify the decisions made

Learning Outcomes
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON7 Create and implement environmental monitoring programs and systems in areas of anthropogenic impact, develop effective prevention measures or take prompt and competent decisions to reduce pollution of environmental objects.

Prerequisites
Introduction to Specialty

Postrequisites
Chemical analysis and environmental assessment

Methods, control devices and analysis environment

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30135 (3013211)
Course	3
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 is aimed at studying the regulatory framework for environmental quality control. The indicators of the quality of atmospheric air, surface and sea waters, soils, as well as control and quality assurance of the analysis results are considered. Weight and volume analytical, electrochemical, optical, chromatographic, remote methods and devices in the analysis of environmental quality are studied. Metrological requirements for methods and instruments for analyzing the composition of the biosphere are described.

Purpose of studying of the discipline
to prepare bachelors for orientation in the field of metrology, and work at enterprises, the realization of knowledge, skills and abilities acquired at the university, students should know the types of environmental devices most used in practice.

Learning Outcomes
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological

ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON7 Create and implement environmental monitoring programs and systems in areas of anthropogenic impact, develop effective prevention measures or take prompt and competent decisions to reduce pollution of environmental objects.

Prerequisites

Bioindicative methods of research

Postrequisites

Final examination

Ecological Monitoring

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30133 (3013209)
Course	3
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 is aimed at studying the concepts, principles of organization and functioning of modern monitoring systems as complex information systems affecting all complex relationships and all components of the environment. During the course, methods for assessing the state of natural and anthropogenic modified ecosystems, methods for assessing and predicting pollution levels of environmental components, as well as abiotic components of the environment by chemical, physico-chemical and biological indicators are considered.

Purpose of studying of the discipline

In the environmental monitoring system, two goals should be constantly implemented:
1. Constant assessment of the "comfort" conditions of the human habitat and other biological objects.
2. Providing an information component for the purposes of forecasting, modeling and management decision-making.

Learning Outcomes

ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON7 Create and implement environmental monitoring programs and systems in areas of anthropogenic impact, develop effective prevention measures or take prompt and competent decisions to reduce pollution of environmental objects.

Prerequisites

Bioindicative methods of research

Postrequisites

Final examination

Environmental monitoring and environmental quality controls

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30134 (3013210)
Course	3
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 is aimed at studying environmental monitoring and its tasks, the main directions of environmental monitoring, levels, scales, methods, principles and monitoring blocks. The means and methods of environmental quality control are considered. In this course, methods and means of measuring and controlling polluted substances, devices for monitoring atmospheric air, drinking water, natural water, water quality assessment indicators are studied.

Purpose of studying of the discipline

To study types of measuring instruments, measuring devices and the characteristic of measuring instruments.

Learning Outcomes

ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON7 Create and implement environmental monitoring programs and systems in areas of anthropogenic impact, develop effective prevention measures or take prompt and competent decisions to reduce pollution of environmental objects.

Prerequisites
Bioindicative methods of research

Postrequisites
Final examination

Definition methods of the air, water and soil pollutants

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30157 (3013206)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Laboratory works	0hours
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 studying methods for determining pollutants in the main objects of the environment. This course examines the methods of sampling natural objects, the basics of sample preparation, conservation and storage of samples. The basic physico-chemical methods of analysis are described. The possibilities of using modern methods of experimental research, methods of mathematical statistics and mathematical modeling in practical activities are compared,

Purpose of studying of the discipline
Mastering the theoretical foundations of the discipline, mastering modern methods of analysis necessary for conducting eco-analytical monitoring.

Learning Outcomes
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON7 Create and implement environmental monitoring programs and systems in areas of anthropogenic impact, develop effective prevention measures or take prompt and competent decisions to reduce pollution of environmental objects.

Prerequisites
Biological ecology

Postrequisites
Final examination

Heavy metals in the Environment

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30154 (3013204)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Laboratory works	0hours
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 studying heavy metals as priority pollutants of the environment, including East Kazakhstan. This course examines the physico-chemical properties of heavy metals, their classification, sources and methods of entry into environmental objects, forms of heavy metal compounds and ways of their migration in different environments. The characteristic of modern methods of studying the forms of existence of heavy metals in natural objects is given.

Purpose of studying of the discipline
To familiarize students with Heavy metals as a group of ecotoxicants, as well as to study chemical processes involving Heavy Metals in

various geospheres of the Earth.

Learning Outcomes

ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON7 Create and implement environmental monitoring programs and systems in areas of anthropogenic impact, develop effective prevention measures or take prompt and competent decisions to reduce pollution of environmental objects.

Prerequisites

Biological ecology

Postrequisites

Final examination

Chemistry of heavy metals

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30155 (3013205)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Laboratory works	0hours
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 studying the basic laws that determine the interaction of living organisms with heavy metals; principles of nature protection from pollution, methods of purification and rational use of natural resources; social and environmental consequences of pollution. This course examines the sources and ways of heavy metals entering objects of the natural environment, forms of heavy metal compounds, biological and physiological effects of heavy metals on living organisms

Purpose of studying of the discipline

Formation of a holistic view of the basic chemical properties of heavy metals, the laws of their interaction with objects of the natural environment.

Learning Outcomes

ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON7 Create and implement environmental monitoring programs and systems in areas of anthropogenic impact, develop effective prevention measures or take prompt and competent decisions to reduce pollution of environmental objects.

Prerequisites

Biological ecology

Postrequisites

Final examination

Geoecology

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	30167 (3013208)
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 is aimed at studying the ecological state and patterns of spatial differentiation of natural and anthropogenic geosystems (landscapes). Ecological factors and their influence on geosystems, ecological problems of certain regions of Kazakhstan, nature protection tasks at the present stage, geosystem resistance to anthropogenic impact are considered. Geographical differences between ecosystem and geosystem, ecological properties of landscapes, geoecological zoning of Kazakhstan, geoecological forecast, ecological level of geosystem are studied.

Purpose of studying of the discipline
The purpose of studying the discipline
To give students fundamental knowledge about the essence of geoecology, the study of the scientific foundations of the doctrine of nature conservation, the study of the fundamental principles of geoecology, as a science of the ecological background of natural-anthropogenic systems of the earth, the practical application of the revealed patterns to the theory and practice of applied ecology.
Learning Outcomes
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON7 Create and implement environmental monitoring programs and systems in areas of anthropogenic impact, develop effective prevention measures or take prompt and competent decisions to reduce pollution of environmental objects.
Prerequisites
Environmental resource studies
Postrequisites
Final examination

Module 6. Problem-ecological

Global social and environmental issues and sustainable development

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30105 (3013198)
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
The discipline is aimed at studying the tasks and subject of social ecology and global ecology. The biosphere is characterized as a global ecosystem; the evolution of the biosphere and environmental crises; modern global environmental problems (climate warming, desertification, etc.). International cooperation in solving global problems is considered; the main tasks and global initiatives in the field of sustainable development; indicators of sustainable development of society, as well as sustainable development of Kazakhstan.
Purpose of studying of the discipline
The purpose of studying the discipline
- cognition of value orientations and attitudes aimed at recreating, preserving and developing the natural and social wealth accumulated by society over a long period of historical development;
- study of the main causes of the contradictory development of the biosphere and the anthroposphere, the resulting global environmental problems and forms of their resolution;
- the development of an ecological worldview based on the study of the history of the origin, development and current state of the relationship "nature-society".
Learning Outcomes
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.
Prerequisites
Bases of economics, law and ecological knowledge
Postrequisites
Ecology of Kazakhstan

Modern ecology and global environmental problems

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30104 (3013197)
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
The discipline is aimed at studying modern ecology as a complex science of environmental protection. The course examines the purpose and main tasks facing modern ecology, including solving such global environmental problems as climate change and adaptation, greenhouse gas emissions, ozone-depleting substances management, waste pollution of the Pacific Ocean, etc.

Purpose of studying of the discipline
Familiarization of students with the conceptual foundations of ecology as a modern complex fundamental science, considering various aspects of the interaction of all components of nature and members of the community, forming an idea of the current state of the biosphere as a result of increasing anthropogenic impact on it, about possible ways to reduce the power of this impact.

Learning Outcomes
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites
Bases of economics, law and ecological knowledge

Postrequisites
Ecology of Kazakhstan

Modern environmental problems of the environment

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30103 (3013183)
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
The discipline is aimed at studying general environmental problems, the negative impact of human economic activity. The features of atmospheric air pollution, degradation and protection of soil cover, the current state of forest ecosystems are considered. The characteristics of physical, chemical and biological pollution of the environment, the impact of environmental pollution on the health of the population are given. Ecological problems of cities and urban settlements, use and protection of water resources are described.

Purpose of studying of the discipline
An overview of environmental problems. The negative impact of human activities. Use and protection of water resources. Features air pollution. Degradation and soil protection. The current state of forest ecosystems. Physical pollution. Contamination of the environment and public health. Environmental problems of cities and urban settlements.

Learning Outcomes
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites
Bases of economics, law and ecological knowledge

Postrequisites
Ecology of Kazakhstan

Environmental management economy

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30141 (3013193)
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 is aimed at studying the basic concepts of the course, sources of ecological and economic information, basic methods of analysis, assessment and practical solution of ecological and economic problems in the process of using, protecting and reproducing resources. The course examines: methods and techniques of ecological and economic analysis of the activities of economic entities; the economic value of natural resources and services; ecological and economic efficiency and calculation of the economic damage caused.

Purpose of studying of the discipline
The study of theoretical and practical issues in the field of rational use of natural resources, to solve ecological and economic problems of production.

Learning Outcomes
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites
Environmental resource studies

Postrequisites
Recovery, recycling and disposal of consumer waste

Ecological safety of the Republic of Kazakhstan

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30138 (3013186)
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 is aimed at studying legislative acts and principles of ensuring environmental safety, as well as problems and ways to solve them (climate change, ozone layer destruction, biodiversity conservation, desertification and land degradation, environmental disaster zones, problems related to the development of resources of the Caspian Sea shelf, the impact of military space and test complexes, radioactive, chemical and bacteriological contamination). The issues of environmental monitoring and statistics, international cooperation are considered.

Purpose of studying of the discipline
to train young professionals who know the basic principles of environmental safety, focused on the transition to sustainable development;
** to familiarize students with the main strategic directions of the state policy in the field of environmental safety of the Republic of Kazakhstan;*
** to form theoretical knowledge and practical skills in the field of environmental safety, environmental outlook and environmental culture, taking into account the future professional activity of the student.*

Learning Outcomes
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites
Environmental chemistry

Postrequisites
Quality management and control environment

Landscapes of Kazakhstan

Discipline cycle	Basic disciplines

Discipline component	Electives
SubjectID	30144 (3013195)
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 is aimed at studying the diversity of landscapes of Kazakhstan. The course examines the classification of landscapes, the peculiarities of the ecology of forest-steppe, steppe, desert and mountain regions, their flora and fauna. Ecological problems of natural and anthropogenic landscapes of Kazakhstan are evaluated. The basics of environmental management measures to maintain the biodiversity of landscapes and the measures taken to preserve the natural landscapes of Kazakhstan are described.

Purpose of studying of the discipline

Formation of basic ideas about environmental problems of natural and anthropogenic landscapes on the territory of Kazakhstan.

Learning Outcomes

ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites

Reserved matter in RK

Postrequisites

Topical issues of radioecology of Kazakhstan

Legal basis and procedure for state environmental control

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30151 (3013249)
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 is aimed at studying state environmental control in the field of environmental protection, conservation, reproduction and use of natural resources. The course covers:
the legal basis and procedure for the organization of state environmental control, based on the current regulatory framework of the Republic of Kazakhstan;
state bodies exercising environmental control; functional rights and duties of officials exercising state environmental control.

Purpose of studying of the discipline

familiarization with the basic theoretical provisions of the legal framework and the procedure for conducting state environmental control, mastering knowledge in the field of current environmental legislation and practice

Learning Outcomes

ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites

Environmental chemistry

Postrequisites

Quality management and control environment

Industrial ecology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30139 (3013191)
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 is aimed at studying the resources of the natural system, their use, the quality of the natural environment and its main pollutants - industrial production. The course covers: assessment of total environmental impacts; pollution of the atmosphere and hydrosphere; reduction of the level of hazardous impacts of industrial production on the natural environment; methods of cleaning industrial emissions, discharges and bioprotective equipment; greening of production; legal norms for environmental protection.

Purpose of studying of the discipline

to acquaint students with the main stages of the formation of the relationship between man and nature; sources of industrial pollution of the environment, the impact of industrial pollution on living organisms;

** to show the contradictions between the production of material goods, the laws of the development of the natural system with OS resources and the peculiarities of their use;*

** to form theoretical knowledge and practical skills in the field of environmental protection, ecological outlook and ecological culture, taking into account the future professional activity of the student.*

Learning Outcomes

ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment

ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.

ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites

Environmental resource studies

Postrequisites

Recovery, recycling and disposal of consumer waste

Ecological safety of the Republic of Kazakhstan

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30137 (3013185)
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 is aimed at studying the state and problems of environmental safety of the Republic of Kazakhstan, the relevance and basic principles of their provision. The course covers: global, national, local environmental problems, issues of greening the economy, legislation and society, as well as international cooperation of the Republic of Kazakhstan in the field of environmental protection and nature management, international environmental conventions and agreements ratified by the Republic of Kazakhstan.

Purpose of studying of the discipline

to train young professionals who know the basic principles of environmental safety, focused on the transition to sustainable development;

** to familiarize students with the main strategic directions of the state policy in the field of environmental safety of the Republic of Kazakhstan;*

** to form theoretical knowledge and practical skills in the field of environmental safety, environmental outlook and environmental culture, taking into account the future professional activity of the student.*

Learning Outcomes

ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment

ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the

reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites

Environmental chemistry

Postrequisites

Quality management and control environment

Environmental problems of RK

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30143 (3013194)
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 is aimed at studying environmental problems of the Republic of Kazakhstan of various ranks. The course examines global problems on the example of desertification, regional environmental problems on the example of the drying up of the Aral Sea and pollution of the Caspian Sea, studies local problems of soil contamination with heavy metals in East Kazakhstan, as well as historical pollution. The ways of solving environmental problems of the Republic of Kazakhstan are described.

Purpose of studying of the discipline

Formation of students` modern ideas about the environmental problems of the Republic of Kazakhstan and ways to solve them.

Learning Outcomes

ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites

Reserved matter in RK

Postrequisites

Topical issues of radioecology of Kazakhstan

Ecology and environmental managemen

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30140 (3013192)
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 is aimed at studying regulatory and legal documents in the field of ecology and nature management, principles of rational nature management, environmental regulation and forecasting the consequences of nature management. The course covers: the purpose and legal status of protected areas; the strategy of biodiversity conservation and nature protection; nature protection measures; monitoring, assessment of the state of the natural environment; forecast of changes in natural resources under the influence of anthropogenic factors; organization of project activities in the field of ecology and nature management.

Purpose of studying of the discipline

To acquaint students with the basic concepts of the relationship between man and nature, the contradictions between the production of material goods and the phenomena of the regularity of the development of the natural system with environmental resources and the peculiarities of their use.

Learning Outcomes

ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research,

tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites
Environmental resource studies

Postrequisites
Recovery, recycling and disposal of consumer waste

Ecology of Kazakhstan

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30145 (3013207)
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 is aimed at studying the ecology of Kazakhstan. A general idea of global, regional and local environmental problems is given. The ecology of the atmosphere of Kazakhstan and the problem of pollution of the air basin of cities is considered; the ecology of the hydrosphere of Kazakhstan and the environmental problems of surface waters; the ecology of the lithosphere of Kazakhstan and the activities of military test sites. The state policy and the system of state management of environmental protection in the Republic of Kazakhstan are being studied.

Purpose of studying of the discipline
To form students` modern ideas about the environmental situation in the country, about the rates of environmental pollution and measures to reduce it.

Learning Outcomes
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites
Reserved matter in RK

Postrequisites
Topical issues of radioecology of Kazakhstan

Industrial toxicology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30129 (3013251)
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 study of the discipline is aimed at studying the basic concepts, directions and terminology of industrial toxicology. The following issues are considered: parameters and basic laws of toxicometry; fundamentals of sanitary and hygienic rationing; specifics and mechanism of toxic effect of harmful substances; toxicokinetics; possible effects of industrial poisons; basic theoretical and practical aspects of individual toxicology; antidotes. long-term effects of the poison on the human body.

Purpose of studying of the discipline
The ability to identify toxic substances, to know the characteristics and properties of toxic substances, their impact on the environment and the living organism.

Learning Outcomes
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.
Prerequisites
Global social and environmental issues and sustainable development
Postrequisites
Final examination

Fundamentals of Ecotoxicology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30125 (3013188)
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 devoted to familiarization with the main sources of formation of toxic compounds, migration and transformation in the environment. The characteristics of harmful and dangerous factors of the working environment that can have a negative impact on the employee, the main ways to ensure protection from harmful factors in the course of work, the classification of industrial poisons, the degree of toxicity and danger of harmful substances are given
Purpose of studying of the discipline
Formation of students` knowledge about possible pollution of ecosystems by toxic chemicals and their effect on various types of organisms, as well as the development of skills and
skills for analyzing the risks of contamination by toxicants of soil and vegetation cover.
Learning Outcomes
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.
Prerequisites
Global social and environmental issues and sustainable development
Postrequisites
Final examination

Ecobiotechnology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	30124 (3013187)
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 studying modern methods and techniques of environmental biotechnologies. This course examines the possibilities of using microorganisms for environmental purification; biotechnological methods of processing plant waste; solid waste processing by composting; biological wastewater treatment; sewage sludge; obtaining environmentally friendly fuel; bioremediation of oil-contaminated territories and phytoremediation of soils contaminated with heavy metals.

Purpose of studying of the discipline
To form students` modern ideas about the level of scientific achievements in the field of environmental biotechnology and the use of biotechnological processes and systems for environmental protection and environmental management.
Learning Outcomes
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.
Prerequisites
Global social and environmental issues and sustainable development
Postrequisites
Final examination

Recovery technology and recycling of waste production and consumption

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30132 (3013196)
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 studying ways and methods of waste management, the construction of landfills. This course covers the processing of solid household waste and the basics of technological processes for processing industrial waste. Burial, incineration, disposal of paper, glass containers, plastic packaging, slags, ash and waste of petroleum products, disposal of agricultural waste, recycling and auto-recycling, microbial waste recycling are characterized.
Purpose of studying of the discipline
Ways and methods of waste management. The recycling of solid waste. The device of the polygons. Fundamentals of technological processes of industrial waste processing. Burial, burning. Recycling of paper, glass containers, plastic packaging, slag, ash, waste oil. Recycling of agricultural waste. Recycling. Auto recycling. Microbial waste processing.
Learning Outcomes
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.
Prerequisites
Industrial ecology
Postrequisites
Final examination

Recovery, recycling and disposal of consumer waste

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30131 (3013190)
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
This course examines the classification of waste, methods of its disposal, the occurrence of waste and waste disposal processes in a

historical perspective. Decomposition of solid household waste in landfills, collection and neutralization of filtrate are described. The extraction and utilization of biogas, the organization of the collection and disposal of solid household waste in urban conditions and the processing of solid household waste, the characteristics of solid household waste as an object of processing are also considered.

Purpose of studying of the discipline

The formation of a high level of theoretical and vocational training, Knowing of general concepts and methodological issues of utilization of industrial waste, a deep understanding of the main sections of chemistry and the ability to apply their Knowing to solve research and applications.

Learning Outcomes

ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites

Industrial ecology

Postrequisites

Final examination

Recycling and disposal of waste

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30130 (3013189)
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

This course describes the general characteristics of waste, their structure and classification, the causes of waste. Industrial waste, toxic and household waste, radioactive waste (RAW) are characterized. The impact of waste on the environment is assessed and the placement of solid household waste in Kazakhstan is described. The ways of solving problems with production and consumption waste are considered.

Purpose of studying of the discipline

Protection of the environment from waste pollution is one of the elements of the system of rational use of natural resources. Environmental protection is related to solving social and economic problems

Learning Outcomes

ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites

Industrial ecology

Postrequisites

Final examination

Topical issues of radioecology of Kazakhstan

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30173 (3013199)
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 is aimed at studying topical issues of radioecology of the Republic of Kazakhstan. This course examines the radioecological condition of the former Semipalatinsk
test site and adjacent territories, including the consequences of atmospheric and underground nuclear tests. The radioecological problems of territories with naturally elevated radiation parameters, other test sites of the republic, sites of reactor installations and sites with elevated concentrations of radionuclides are described.
Purpose of studying of the discipline
Mastering fundamental knowledge about the essence of radioecology, the effects of radiation on living organisms, ways to overcome modern radioecological problems in Kazakhstan.
Learning Outcomes
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.
Prerequisites
Radiation ecology
Postrequisites
Final examination

Radiation monitoring

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30160 (3013255)
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 is aimed at studying topical issues of radioecology of the Republic of Kazakhstan. This course examines the radioecological condition of the former Semipalatinsk
test site and adjacent territories, including the consequences of atmospheric and underground nuclear tests. The radioecological problems of territories with naturally elevated radiation parameters, other test sites of the republic, sites of reactor installations and sites with elevated concentrations of radionuclides are described.
Purpose of studying of the discipline
familiarization of students with the basics of radiation monitoring of the environment
Learning Outcomes
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.
Prerequisites
Radiation ecology
Postrequisites
Final examination

Urboecology

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30158 (3013256)
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 is devoted to the study of the basic concepts of urban ecology and mastering the skills of urban monitoring management. The course examines the values of the urban environment as a component that guarantees human life in the city and affects his health, the development of observation systems for local, regional and global monitoring. The characteristics of the organization of environmental monitoring and green spaces are given

Purpose of studying of the discipline
formation of skills of ecological outlook; education of the ability to assess their professional activities from the point of view of the protection of the biosphere, understanding the role of the main components of urban ecosystems: flora and fauna, soils, surface and groundwater, air masses of the troposphere, the resistance of plant communities to the impact of factors of the urban environment.

Learning Outcomes
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites
Radiation ecology

Postrequisites
Final examination

Manufacturing practice III

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30153 (3013258)
Course	4
Term	2
Credits count	15
Working practice	450hours
Total	450hours
Knowledge control form	Total mark on practice

Short description of discipline
In this practice, they study the system of environmental measures carried out at the enterprise, methods and techniques for conducting environmental research, conducting theoretical, experimental and field research, studying methods of economic stimulation of environmental activities of the enterprise. Industrial-safe methods, measures and means are applied in practice, excluding the impact of hazardous and harmful production factors and industrial pollution on workers and the environment.

Purpose of studying of the discipline
of necessary materials on the topic of graduation design (work)

Learning Outcomes
ON6 To set goals and objectives of the experiment, to work with laboratory equipment, to use modern methods of scientific research, tools and devices used in conducting environmental studies and ensuring the safety of the production environment
ON8 Demonstrate the skills of operating treatment facilities and implement technological processes for the processing, disposal and disposal of solid, liquid, radioactive waste with the introduction of low- waste technologies and the organization of work on the reclamation of disturbed lands and the creation of cultural landscapes.
ON9 To assess the possibilities and ways of economic use of natural resources, their distribution and condition, the quality of the natural environment and the level of man-made load to ensure the environmental safety of the region and the republic.

Prerequisites
Production practice II

Postrequisites
Final examination

Module 7. Ecological - regulatory

Bases of ecological rationing and examination

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30176 (3013181)
Course	4
Term	1
Credits count	6
Lections	30hours
Practical and seminar classes	30hours
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 discipline is aimed at studying the theoretical foundations of environmental regulation and expertise. The basic concepts of rationing, types and mechanisms of environmental rationing are considered. Attention is paid to the regulation of the quality of atmospheric air, the assessment of the quality of water resources, environmental regulation of the soil. The environmental impact assessment is given, taking into account ideal and temporary norms, regulations and standards of anthropogenic impact. The skills of environmental audit, environmental insurance, environmental expertise in the Republic of Kazakhstan are being mastered.

Purpose of studying of the discipline
To familiarize students with the types of environmental activities, the system of norms and rules. regulatory documentation, design, environmental protection, rational use of natural resources, environmental safety, as well as with environmental expertise, audit and EIA.

Learning Outcomes
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON5 Possess knowledge of the basics of environmental monitoring, standardization and expertise, industrial ecology, environmental design, legal foundations of environmental management, and the ability to use theoretical knowledge in practical activities.
ON10 Develop environmental projects, coordinating environmental documentation at enterprises, environmental protection action plans with the implementation and implementation of industrial environmental control and compliance with requirements, labor protection and safety standards.

Prerequisites
Environmental monitoring and environmental quality controls

Postrequisites
Final examination

Occupational Safety and Health

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30165 (3013239)
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 is aimed at studying the management system and the organizational and legal foundations of labor protection, the state of occupational injuries and occupational diseases. The course covers: industrial sanitation and occupational hygiene; certification of workplaces according to working conditions; harmful substances in the air of the working area; dust; lighting; microclimate; noise and vibration; ionizing radiation; intensity and severity of work; classification of protective equipment; safety; fire and electrical safety

Purpose of studying of the discipline
Eliminate the impact of dangerous and harmful production factors on humans, ensure the safety of the production process and production equipment, optimize labor processes and the production environment.

Learning Outcomes
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON5 Possess knowledge of the basics of environmental monitoring, standardization and expertise, industrial ecology, environmental design, legal foundations of environmental management, and the ability to use theoretical knowledge in practical activities.
ON10 Develop environmental projects, coordinating environmental documentation at enterprises, environmental protection action plans with the implementation and implementation of industrial environmental control and compliance with requirements, labor protection and safety standards.

Prerequisites
Industrial ecology

Postrequisites
Final examination

Social ecology and sustainable development

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30175 (3013182)
Course	4
Term	1
Credits count	6
Lections	30hours
Practical and seminar classes	30hours

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 discipline is aimed at studying the tasks and subject of social ecology and sustainable development. The biosphere is characterized as a global ecosystem; the evolution of the biosphere and environmental crises; modern global environmental problems (climate warming, desertification, etc.). The concept of the environment in social ecology is considered; natural and social components, their ratio; assessment of the quality of the natural environment and the level of anthropogenic load.

Purpose of studying of the discipline
Subject, tasks, laws social ecology. The concept environment in social ecology. Natural and social components, their ratio. Modern environmental problems. Assessment the quality the natural environment, the level anthropogenic load. Key challenges, global initiatives for sustainable development. Indicators sustainable growth society. Kazakhstan is on the way to sustainable development.

Learning Outcomes
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON5 Possess knowledge of the basics of environmental monitoring, standardization and expertise, industrial ecology, environmental design, legal foundations of environmental management, and the ability to use theoretical knowledge in practical activities.
ON10 Develop environmental projects, coordinating environmental documentation at enterprises, environmental protection action plans with the implementation and implementation of industrial environmental control and compliance with requirements, labor protection and safety standards.

Prerequisites
Environmental monitoring and environmental quality controls

Postrequisites
Final examination

Ecological design

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30171 (3013180)
Course	4
Term	1
Credits count	6
Lections	30hours
Practical and seminar classes	30hours
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 discipline is aimed at studying the basic concepts, principles and methods of environmental design. This course examines the introduction of theoretical as well as practical skills of design objects taking into account the requirements of nature protection, the formation of experience working with regulatory documents in the field of environmental projects.

Purpose of studying of the discipline
Study of the procedure for environmental support of economic activity projects, including environmental justification of projects, environmental expertise of projects and modern state expertise of projects within the framework of the state-legal mechanism for environmental quality management and rational use of natural resources.

Learning Outcomes
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON5 Possess knowledge of the basics of environmental monitoring, standardization and expertise, industrial ecology, environmental design, legal foundations of environmental management, and the ability to use theoretical knowledge in practical activities.
ON10 Develop environmental projects, coordinating environmental documentation at enterprises, environmental protection action plans with the implementation and implementation of industrial environmental control and compliance with requirements, labor protection and safety standards.
ON12 To make decisions on modern environmental problems of various levels based on the achievements of science and practice, advanced domestic and foreign experience

Prerequisites
Research Methods of Ecology

Postrequisites
Final examination

The main problems of ecology

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30164 (3013242)
Course	4

Term	1
Credits count	6
Lections	30hours
Practical and seminar classes	30hours
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 discipline is aimed at studying the territorial aspects of the formation of modern global environmental processes, problems of population growth, food and energy problems, the global raw materials crisis and nuclear threat, environmental problems of the oceans and the depletion of freshwater resources, interethnic mechanisms for regulating international ecological and economic relations. International cooperation in solving global environmental problems is considered; the main tasks and global initiatives in the field of sustainable development

Purpose of studying of the discipline

The course examines the territorial aspects the formation modern global environmental processes, the problems population growth, food and energy problems, the global raw materials crisis and nuclear threat, the environmental problems the Oceans and the depletion of freshwater resources, the international mechanism regulation international environmental and economic relations.

Learning Outcomes

ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON5 Possess knowledge of the basics of environmental monitoring, standardization and expertise, industrial ecology, environmental design, legal foundations of environmental management, and the ability to use theoretical knowledge in practical activities.
ON10 Develop environmental projects, coordinating environmental documentation at enterprises, environmental protection action plans with the implementation and implementation of industrial environmental control and compliance with requirements, labor protection and safety standards.

Prerequisites

Environmental monitoring and environmental quality controls

Postrequisites

Final examination

Bases of management of labor protection

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30161 (3013254)
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 is aimed at studying a complex of issues of occupational safety management, including: principles of ensuring, state regulation and obligations of the employer to ensure safe working conditions; management of internal motivation of employees for safe work; social partnership of the employer and employees; certification of workplaces; development of instructions and organization of training on occupational safety; provision of employees with personal protective equipment; prevention occupational morbidity; documentation and reporting on labor protection.

Purpose of studying of the discipline

** formation of an understanding of the modern concept of safe work in direct relationship with the issues of occupational safety management at work;*
** providing future environmental engineers with theoretical knowledge and practical skills necessary to address issues related to ensuring safe working conditions in the organization of production, excluding negative impacts on humans and the environment.*

Learning Outcomes

ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON5 Possess knowledge of the basics of environmental monitoring, standardization and expertise, industrial ecology, environmental design, legal foundations of environmental management, and the ability to use theoretical knowledge in practical activities.
ON10 Develop environmental projects, coordinating environmental documentation at enterprises, environmental protection action plans with the implementation and implementation of industrial environmental control and compliance with requirements, labor protection and safety standards.

Prerequisites

Industrial ecology

Postrequisites

Final examination

Labor protection, safety measures at the enterprise

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30162 (3013253)
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 is aimed at studying legal support in the field of occupational health and safety, the state of occupational injuries and occupational morbidity at work. The course covers: occupational safety management at the enterprise; industrial sanitation and occupational hygiene; protection from hazardous and harmful production factors; electrical and fire safety; means and devices to ensure the safety of the production environment

Purpose of studying of the discipline

To study the legislation of the Republic of Kazakhstan and state legal acts on labor protection and safety of industrial activity. To study the responsibilities of employees and employers to ensure safe working conditions and labor protection.

Learning Outcomes

ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON5 Possess knowledge of the basics of environmental monitoring, standardization and expertise, industrial ecology, environmental design, legal foundations of environmental management, and the ability to use theoretical knowledge in practical activities.
ON10 Develop environmental projects, coordinating environmental documentation at enterprises, environmental protection action plans with the implementation and implementation of industrial environmental control and compliance with requirements, labor protection and safety standards.

Prerequisites

Industrial ecology

Postrequisites

Final examination

Development of environmental projects

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30159 (3013179)
Course	4
Term	1
Credits count	6
Lections	30hours
Practical and seminar classes	30hours
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 discipline is aimed at studying the theoretical foundations and practical skills of environmental design. This course covers the basics of the development of draft standards for maximum permissible emissions and standards for maximum permissible discharges (MPD and MPD), Waste Management Programs, the project "Environmental Impact Assessment (EIA)" as one of the stages of Environmental assessment, Screening of the impact of planned activities and post- project analysis of actual impacts during the implementation of activities.

Purpose of studying of the discipline

Familiarization with the development of all types of project documentation related to environmental protection and nature management, subject to mandatory state environmental expertise in accordance with the Environmental Code of the Republic of Kazakhstan.

Learning Outcomes

ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON5 Possess knowledge of the basics of environmental monitoring, standardization and expertise, industrial ecology, environmental design, legal foundations of environmental management, and the ability to use theoretical knowledge in practical activities.
ON10 Develop environmental projects, coordinating environmental documentation at enterprises, environmental protection action plans with the implementation and implementation of industrial environmental control and compliance with requirements, labor protection and safety standards.
ON12 To make decisions on modern environmental problems of various levels based on the achievements of science and practice, advanced domestic and foreign experience

Prerequisites
Research Methods of Ecology
Postrequisites
Final examination

Chemical analysis

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30170 (3013200)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Laboratory works	0hours
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 studying chemical analysis and the possibilities of its application in environmental research. This course covers the basics of chemical analysis; the study of the chemical composition of natural and man-made compounds using qualitative and quantitative analysis; modern methods of chemical analysis of objects of anthropogenic activity and environmental components; the role of the analytical chemist and chemical analysis in ecological and analytical control.
Purpose of studying of the discipline
Fundamentals of analytical chemistry; qualitative and quantitative methods for studying the chemical composition of compounds and products; chemical methods for analyzing components and objects of industry and the environment
Learning Outcomes
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON5 Possess knowledge of the basics of environmental monitoring, standardization and expertise, industrial ecology, environmental design, legal foundations of environmental management, and the ability to use theoretical knowledge in practical activities.
ON10 Develop environmental projects, coordinating environmental documentation at enterprises, environmental protection action plans with the implementation and implementation of industrial environmental control and compliance with requirements, labor protection and safety standards.
ON12 To make decisions on modern environmental problems of various levels based on the achievements of science and practice, advanced domestic and foreign experience
Prerequisites
Quality management and control environment
Postrequisites
Final examination

Chemical analysis and environmental assessment

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30169 (3013201)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Laboratory works	0hours
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 practical skills of chemical analysis and studying the theoretical foundations of environmental assessment. This course covers the basic requirements for sampling; priority controlled environmental parameters and physico-chemical methods of their analysis. Methodological aspects of environmental assessment of the quality of a natural object, features and criteria of environmental assessment of atmospheric air, surface waters, soils are studied.
Purpose of studying of the discipline
Assessment of the impact of environmental pollution with harmful substances. Assessment of Environmental Quality by chemical analysis methods. Standards and regulations, regulatory documents, Environmental Quality Standards, Environmental Quality Control using instrumental control tools
Learning Outcomes

ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON5 Possess knowledge of the basics of environmental monitoring, standardization and expertise, industrial ecology, environmental design, legal foundations of environmental management, and the ability to use theoretical knowledge in practical activities.
ON10 Develop environmental projects, coordinating environmental documentation at enterprises, environmental protection action plans with the implementation and implementation of industrial environmental control and compliance with requirements, labor protection and safety standards.
ON12 To make decisions on modern environmental problems of various levels based on the achievements of science and practice, advanced domestic and foreign experience

Prerequisites
Quality management and control environment

Postrequisites
Final examination

Chemistry and physics of the environ-ment

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30168 (3013202)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Laboratory works	0hours
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 studying the basics of chemistry and physics of the environment. This course examines the physico-chemical processes occurring in natural objects. The features of atmospheric circulation and the processes of dispersion of pollutants in the atmospheric air, acid-base equilibrium in the hydrosphere and chemical pollution of natural waters, physico-chemical parameters of the lithosphere, soil chemistry and soil contamination are described.

Purpose of studying of the discipline
formation of professional competencies necessary for the successful implementation of various types of professional activities in the field of chemical analysis, organization and conduct of chemical and environmental monitoring. Environmental Chemistry. Atmospheric chemistry. Contaminants in the atmosphere. Chemistry of the hydrosphere. Chemical processes and integral characteristics of natural waters. The pollutants in natural waters. Chemistry lithosphere. Laws of formation of rocks. Laws of chemical weathering of rocks. Soil Chemistry. Physics environment.

Learning Outcomes
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON5 Possess knowledge of the basics of environmental monitoring, standardization and expertise, industrial ecology, environmental design, legal foundations of environmental management, and the ability to use theoretical knowledge in practical activities.
ON10 Develop environmental projects, coordinating environmental documentation at enterprises, environmental protection action plans with the implementation and implementation of industrial environmental control and compliance with requirements, labor protection and safety standards.
ON12 To make decisions on modern environmental problems of various levels based on the achievements of science and practice, advanced domestic and foreign experience

Prerequisites
Quality management and control environment

Postrequisites
Final examination

Energy-saving environmental technologies

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30163 (3013252)
Course	4
Term	1
Credits count	6
Lections	30hours
Practical and seminar classes	30hours
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 discipline is aimed at studying energy-saving environmental protection technologies for established or operating industries. The course describes modern energy-saving production technologies, as well as low- and waste-free systems. The methods of purification of atmospheric air, wastewater from polluting components and the possibility of recycling the resulting waste to obtain, for example, biogas are considered. The energy balance of production is analyzed for optimal use of resources and improvement of environmental safety of the facility.
Purpose of studying of the discipline
Formation of a system of scientific knowledge and introduction of technologies
Learning Outcomes
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON5 Possess knowledge of the basics of environmental monitoring, standardization and expertise, industrial ecology, environmental design, legal foundations of environmental management, and the ability to use theoretical knowledge in practical activities.
ON10 Develop environmental projects, coordinating environmental documentation at enterprises, environmental protection action plans with the implementation and implementation of industrial environmental control and compliance with requirements, labor protection and safety standards.
ON12 To make decisions on modern environmental problems of various levels based on the achievements of science and practice, advanced domestic and foreign experience
Prerequisites
Research Methods of Ecology
Postrequisites
Final examination

Prediploma practice

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	30152 (3013237)
Course	4
Term	2
Credits count	15
Undergraduate practice	450hours
Total	450hours
Knowledge control form	Total mark on practice

Short description of discipline
Pre-graduate practice is the completion of writing a thesis. In this practice, students are engaged in the collection and processing, generalization; analysis of statistical data and practical material on the topic of graduation research. The formulation of conclusions, patterns, recommendations and suggestions on the topic of the thesis are also considered. Knowledge is applied, making professional conclusions in the field of practical training, the formation of a scientific worldview, the development of logical thinking, the development of modern theoretical and experimental research methods.
Purpose of studying of the discipline
of necessary materials on the topic of graduation design (work)
Learning Outcomes
ON4 To describe the basic general professional ideas about the theoretical foundations of the doctrine of the biosphere, biological ecology, systemic ecology, social ecology, radiation ecology, geoecology, bioindication.
ON5 Possess knowledge of the basics of environmental monitoring, standardization and expertise, industrial ecology, environmental design, legal foundations of environmental management, and the ability to use theoretical knowledge in practical activities.
ON10 Develop environmental projects, coordinating environmental documentation at enterprises, environmental protection action plans with the implementation and implementation of industrial environmental control and compliance with requirements, labor protection and safety standards.
Prerequisites
Production practice II
Postrequisites
Final examination

Final Certification

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

Diploma work

Credits count	8

Comprehensive exam

Credits count	8

4.Summary table on the scope of the educational program

«6B05201 - Ecology»

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
Bases of economics, law and ecological knowledge	GER/US	1	5	150	15	30		35	70	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
History of Kazakhstan	GER/CC	2	5	150	30	15		35	70	Qualification examination
The module of socio-political knowledge (sociology, political science, cultural studies, psychology)	GER/CC	2	8	240	30	45		55	110	Examination
Russian language	GER/CC	2	5	150		45		35	70	Examination
Physical Culture	GER/CC	2	2	60		60				Differentiated attestation
Physical Culture	GER/CC	3	2	60		60				Differentiated attestation
World of Abai	BS/US	3	3	90	15	15		20	40	Examination
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
Philosophy	GER/CC	5	5	150	15	30		35	70	Examination
Module 2. Fundamentals of professional knowledge										
Introduction to Specialty	BS/CCh	1	3	90	15	15		20	40	Examination
Origin and Evolution of the Biosphere	BS/CCh	1	3	90	15	15		20	40	Examination
Environmental aspects of natural philosophy	BS/CCh	1	3	90	15	15		20	40	Examination
Educational practice	BS/US	2	2	60						Total mark on practice
Environmental resource studies	BS/US	4	5	150	15	30		35	70	Examination
Elementary System Ecology	BS/US	4	5	150	15	30		35	70	Examination
Research Methods of Ecology	BS/CCh	5	5	150	15	15	15	35	70	Examination
Nature conservation and rational use of natural resources	BS/CCh	5	5	150	15	15	15	35	70	Examination
Agricultural ecology	BS/CCh	5	5	150	15	15	15	35	70	Examination

Module 3. Natural Science										
Pedology	BS/US	3	5	150	15	30	0	35	70	Examination
Chemistry	BS/US	3	5	150	15	15	15	35	70	Examination
Environmental chemistry	BS/US	3	5	150	15	30	0	35	70	Examination
Radiation ecology	BS/CCh	5	5	150	15	30		35	70	Examination
Radiation Safety Basic	BS/CCh	5	5	150	15	30		35	70	Examination
Radiological RK problems	BS/CCh	5	5	150	15	30		35	70	Examination
Biogeochemistry and Ecotoxicology	BS/US	6	5	150	15	30		35	70	Examination
Module 4. Biological										
Biological ecology	BS/US	1	5	150	15	30		35	70	Examination
Forest protection	BS/CCh	1	3	90	15	15		20	40	Examination
Ecology of animals	BS/CCh	1	3	90	15	15		20	40	Examination
Ecology of animals and plants	BS/CCh	1	3	90	15	15		20	40	Examination
Bioindicative methods of research	BS/CCh	2	5	150	15	30		35	70	Examination
Biological levels of impact of pollution of the biosphere	BS/CCh	2	5	150	15	30		35	70	Examination
Biotecting of urban areas	BS/CCh	2	5	150	15	30		35	70	Examination
Protection of land ecosystems	BS/CCh	3	5	150	15	30		35	70	Examination
Basis of Biochymistry	BS/CCh	3	5	150	15	30		35	70	Examination
Protection of terrestrial and aquatic ecosystems	BS/CCh	3	5	150	15	30		35	70	Examination
Theory and practice of nature conservation in the RK	BS/CCh	4	5	150	15	30		35	70	Examination
Biogeography with fundamentals of ecology	BS/CCh	4	5	150	15	30		35	70	Examination
Reserved matter in RK	BS/CCh	4	5	150	15	30		35	70	Examination
Protection of a plant and animal life	BS/CCh	4	5	150	15	30		35	70	Examination
Production practice I	BS/US	4	5	150						Total mark on practice
Ecological biogeography	BS/CCh	4	5	150	15	30		35	70	Examination
Ecological foundations of biodiversity	BS/CCh	4	5	150	15	30		35	70	Examination
Module 5. Environmental -monitoring										
Production practice II	BS/US	6	5	150						Total mark on practice
Quality management and control environment	BS/US	6	5	150	15	30		35	70	Examination
Methods, control devices and analysis environment	AS/CCh	6	5	150	15		30	35	70	Examination
Ecological Monitoring	AS/CCh	6	5	150	15		30	35	70	Examination
Environmental monitoring and environmental quality controls	AS/CCh	6	5	150	15		30	35	70	Examination
Definition methods of the air, water and soil pollutants	BS/CCh	7	5	150	15	30	0	35	70	Examination
Heavy metals in the Environment	BS/CCh	7	5	150	15	30	0	35	70	Examination

Chemistry of heavy metals	BS/CCh	7	5	150	15	30	0	35	70	Examination
Geoecology	AS/US	7	5	150	15	30		35	70	Examination
Module 6. Problem-ecological										
Global social and environmental issues and sustainable development	BS/CCh	3	3	90	15	15		20	40	Examination
Modern ecology and global environmental problems	BS/CCh	3	3	90	15	15		20	40	Examination
Modern environmental problems of the environment	BS/CCh	3	3	90	15	15		20	40	Examination
Environmental management economy	BS/CCh	5	5	150	15	30		35	70	Examination
Ecological safety of the Republic of Kazakhstan	BS/CCh	5	5	150	15	30		35	70	Examination
Landscapes of Kazakhstan	BS/CCh	5	5	150	15	30		35	70	Examination
Legal basis and procedure for state environmental control	BS/CCh	5	5	150	15	30		35	70	Examination
Industrial ecology	BS/CCh	5	5	150	15	30		35	70	Examination
Ecological safety of the Republic of Kazakhstan	BS/CCh	5	5	150	15	30		35	70	Examination
Environmental problems of RK	BS/CCh	5	5	150	15	30		35	70	Examination
Ecology and environmental managemen	BS/CCh	5	5	150	15	30		35	70	Examination
Ecology of Kazakhstan	BS/CCh	5	5	150	15	30		35	70	Examination
Industrial toxicology	BS/CCh	6	5	150	15	30		35	70	Examination
Fundamentals of Ecotoxicology	BS/CCh	6	5	150	15	30		35	70	Examination
Ecobiotechnology	BS/CCh	6	5	150	15	30		35	70	Examination
Recovery technology and recycling of waste production and consumption	AS/CCh	6	5	150	15	30		35	70	Examination
Recovery, recycling and disposal of consumer waste	AS/CCh	6	5	150	15	30		35	70	Examination
Recycling and disposal of waste	AS/CCh	6	5	150	15	30		35	70	Examination
Topical issues of radioecology of Kazakhstan	AS/CCh	7	5	150	15	30		35	70	Examination
Radiation monitoring	AS/CCh	7	5	150	15	30		35	70	Examination
Urboecology	AS/CCh	7	5	150	15	30		35	70	Examination
Manufacturing practice III	AS/CCh	8	15	450						Total mark on practice
Module 7. Ecological - regulatory										
Bases of ecological rationing and examination	AS/CCh	7	6	180	30	30		40	80	Examination
Occupational Safety and Health	AS/CCh	7	5	150	15	30		35	70	Examination
Social ecology and sustainable development	AS/CCh	7	6	180	30	30		40	80	Examination
Ecological design	AS/CCh	7	6	180	30	30		40	80	Examination
The main problems of ecology	AS/CCh	7	6	180	30	30		40	80	Examination
Bases of management of labor protection	AS/CCh	7	5	150	15	30		35	70	Examination
Labor protection, safety measures at the enterprise	AS/CCh	7	5	150	15	30		35	70	Examination
Development of environmental projects	AS/CCh	7	6	180	30	30		40	80	Examination

Chemical analysis	AS/CCh	7	5	150	15	30	0	35	70	Examination
Chemical analysis and environmental assessment	AS/CCh	7	5	150	15	30	0	35	70	Examination
Chemistry and physics of the environ-ment	AS/CCh	7	5	150	15	30	0	35	70	Examination
Energy-saving environmental technologies	AS/CCh	7	6	180	30	30		40	80	Examination
Prediploma practice	AS/CCh	8	15	450						Total mark on practice
Final Certification										
Diploma work		8	8	240						
Comprehensive exam		8	8	240						