The list of academic disciplines of the university component

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

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

0114
(Code in the International Standard Classification of Education)

B012 - Chemistry teacher training
(Code and classification of the educational program group)

6B01509 - Chemistry-Biology
(Code and name of the educational program)

Bachelor
(Level of preparation)

set of 2023

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Developed
By the Academic Committee of the EP
The head of the AC Mukayev Zh
EP Manager Ontagarova D

Reviewed
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Natural and Mathematical of the faculty
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Chairman of the Commission Zheldybayeva B.S.

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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.

Introduction to the profession of teacher of chemistry and biology

Discipline cycle	Basic disciplines
Course	1
Credits count	3
Knowledge control form	Examination

Short description of discipline
This discipline develops knowledge, skills of organizing educational work and improves the pedagogical skills of students. Ensures the effective use of pedagogical approaches and methodological materials on the subject. Students form ideas about the main features of the image of a teacher of chemistry and biology, about the need for continuous education and self-education.

Purpose of studying of the discipline
Understand the goals of chemical and biological education, patterns and principles of content selection, means of form and methods for their implementation

Learning Outcomes
ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.
ON3 Analyze and apply pedagogical and methodological norms and documents in the field of social, professional and scientific communications.
ON4 Apply educational resources and modern media and information technology in the educational process.

Learning outcomes by discipline
- *compare and discuss the content and principles of construction of sections of chemistry and biology*
- *creative approach to solving educational and educational problems*
- *to study various methods and means of knowledge control.*

Prerequisites
School course

Postrequisites
Pedagogical practice (psychological and pedagogical)

Age psychology and physiology

Discipline cycle	Basic disciplines
Course	1
Credits count	5
Knowledge control form	Examination

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

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

Learning Outcomes
ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.
ON3 Analyze and apply pedagogical and methodological norms and documents in the field of social, professional and scientific communications.
ON4 Apply educational resources and modern media and information technology in the educational process.

Learning outcomes by discipline
1. the formation of an understanding of the mental and physiological development of a person about different views on the most important issues of physiological development with psychology in the aspect of cultural development.
2. strengthens the professional psychological, pedagogical and physiological training of students.
3. equipping with theoretical and practical knowledge, contributing to the improvement of psychophysiological knowledge.

Prerequisites
School course

Postrequisites
Pedagogical practice (psychological and pedagogical)

Bases of economics, law and ecological knowledge

Discipline cycle	General educational disciplines
Course	1
Credits count	5
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
ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.
Learning outcomes by discipline
* analyzes the issues of safety and conservation of the natural environment as the most important priorities of life;*
* demonstrates knowledge of the fundamentals of nature management and sustainable development, assesses the impact of man-made systems on the environment;*
* shows knowledge of the main regulatory legal acts of the Republic of Kazakhstan, their understanding and application;*
* shows knowledge of the patterns of development of economic processes, clearly formulates his own position, finds and clearly sets out arguments in its defense;*
* is able to characterize the types of entrepreneurial activity and the entrepreneurial environment, draw up a business plan, create an entrepreneurial structure and organize its activities;*
* knows the fundamental provisions about the role of leadership in managing large and small social groups.*
Prerequisites
School course
Postrequisites
Basic and profile disciplines of the EP

Pedagogy

Discipline cycle	Basic disciplines
Course	1
Credits count	5
Knowledge control form	Examination

Short description of discipline
The content of the discipline is aimed at forming students` holistic understanding of the theoretical and methodological foundations of pedagogical science and the essence of professional pedagogical activity. Studying the course allows you to form the necessary knowledge about the content, principles, forms and methods of organizing a holistic pedagogical process in an educational environment. The study of the course forms the necessary competencies for the successful implementation of modern approaches in teaching and learning.
Purpose of studying of the discipline
Pedagogy as an academic discipline aims to form students` knowledge about the object and subject of pedagogy, its functions, categorical apparatus, methodology of science. The study of the course provides for the formation of the necessary competencies in the design and evaluation of the pedagogical process in the conditions of an educational institution.The content of the discipline topics allows you to acquire knowledge and skills in the selection and successful application of forms, means, methods of teaching and upbringing.
Learning Outcomes
ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.
ON3 Analyze and apply pedagogical and methodological norms and documents in the field of social, professional and scientific communications.
ON4 Apply educational resources and modern media and information technology in the educational process.
Learning outcomes by discipline
ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.
1. Knows the basic concepts of the theory of the subject
2. Has knowledge in the system of pedagogical training and makes decisions taking into account the holistic pedagogical process
3. Applies the basic skills of the teacher`s profession
Prerequisites
School course
Postrequisites
Basic and profile disciplines of the EP

Educational practice

Discipline cycle	Basic disciplines
Course	1
Credits count	2
Knowledge control form	Total mark on practice

Short description of discipline
Educational practice is aimed at studying animals in natural conditions and identifying the main patterns of their ecology. Has an idea of the inseparable connection between the form and function of living organisms, makes observations of living organisms in nature and in the laboratory, demonstrates scientific concepts and research methods in modern biology, the skills of naturalistic work and environmental protection.
Purpose of studying of the discipline

The main purpose of mastering the discipline is to familiarize students with the diversity of animals and plants of various landscapes in natural conditions and to give students an idea of the basic methods of field biological research, processing and storage of materials.

Learning Outcomes

ON 6 Systematize theoretical material on fundamental disciplines in the independent search, analysis, and selection of the necessary information, its transformation, preservation, and transmission.

ON7 Demonstrate the theoretical foundations and current trends in the development of biology, using knowledge about the diversity and functioning of biological systems, their diversity and evolution, the level organization of wildlife.

Learning outcomes by discipline

- *To describe the main methods of animal and plant research, the main morphological features of animals and plants, special terminology, Latin names of the most important classes, families and species of animals and plants, characteristic features of these taxa, ecological features, practical and biocenotic significance of the most common in the conditions of educational practice of animals and plants;*
- *Distinguish in the field by the appearance and characteristic traces of activity of the most typical animals and plants of the local fauna and flora, determine the systematic position of animals and plants with the help of determinants, collect animals using various methods and equipment;*
- *Carry out cameral processing of the collected field material, conduct observations of animals and record them in a field diary, competently conduct excursions into nature, make collections, herbariums of plants, draw up reporting materials.*

Prerequisites

School course

Postrequisites

Field training practice

Inclusive education

Discipline cycle	Basic disciplines
Course	2
Credits count	3
Knowledge control form	Examination

Short description of discipline

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

Purpose of studying of the discipline

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

Learning Outcomes

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

ON3 Analyze and apply pedagogical and methodological norms and documents in the field of social, professional and scientific communications.

ON4 Apply educational resources and modern media and information technology in the educational process.

Learning outcomes by discipline

1. Scientific and practical ideas about the integration of children with disabilities are being formed.

2. Acquainted with the methodological and managerial work of educational organizations in the context of inclusive practice.

3. Understands the peculiarities of the education of children with disabilities in the educational process in inclusive educational organizations.

Prerequisites

Age psychology and physiology

Postrequisites

Basic and profile disciplines of the EP

World of Abai

Discipline cycle	Basic disciplines
Course	2
Credits count	3
Knowledge control form	Examination

Short description of discipline

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

Purpose of studying of the discipline

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

Learning Outcomes

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

Learning outcomes by discipline
1) Analyzes the philosophical and artistic foundations of works, historical facts related to the creative heritage of Abai Kunanbayev, Shakarim Kudaiberdiyev, Mukhtar Auezov
2) Uses in practice the humanistic ideas of Abai`s philosophical and artistic works
3) Assesses the place and significance of Abai`s works in the history of literature and science
Prerequisites
The module of socio-political knowledge (sociology, political science, cultural studies, psychology)
Postrequisites
Basic and profile disciplines of the EP

Pedagogical practice

Discipline cycle	Basic disciplines
Course	2
Credits count	1
Knowledge control form	Total mark on practice

Short description of discipline
The content of the practice is aimed at forming an idea about the features of the organization of the educational and pedagogical process and the management system in the holistic pedagogical process of the school. The student gets acquainted with all types and areas of activity of the teacher, including the system of work of the class teacher, observation during lessons and extracurricular activities, psychological and pedagogical diagnostics of the age characteristics of the development of students, and conducts psychological and pedagogical educational work.
Purpose of studying of the discipline
The purpose of pedagogical practice is the formation of professional pedagogical competencies related to the design and implementation of the educational process of teaching in the education system, providing conditions for the social and professional adaptation of students, mastering the norms and values of the teaching profession, gaining experience in practical pedagogical activity, becoming a professional orientation of their personality.
Learning Outcomes
ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.
ON3 Analyze and apply pedagogical and methodological norms and documents in the field of social, professional and scientific communications.
ON4 Apply educational resources and modern media and information technology in the educational process.
Learning outcomes by discipline
Familiarization with the pedagogical process of various types of schools:
- the main directions of work of schools in the context of education reform;
-State Standards of Education for an academic subject in a certain class;
- equipment of school classrooms in academic subjects and the state of computerization of the school;
- the state of management in the school (the basics of management).
Prerequisites
Pedagogy
Postrequisites
Pedagogical practice

Pedagogical practice (psychological and pedagogical)

Discipline cycle	Basic disciplines
Course	2
Credits count	2
Knowledge control form	Total mark on practice

Short description of discipline
The content of psychological and pedagogical practice is aimed at forming an idea about the peculiarities of the organization of the educational and pedagogical process and the management system in the holistic pedagogical process of the school. The student gets acquainted with all types and directions of the teacher`s activities, including the system of work of the class teacher, observation during lessons and extracurricular activities, psychological and pedagogical diagnostics of the age characteristics of the development of students, conducts psychological and pedagogical educational work.
Purpose of studying of the discipline
The purpose of pedagogical practice is the formation of professional pedagogical competencies related to the design and implementation of the educational process of teaching in the education system, providing conditions for the social and professional adaptation of students, mastering the norms and values of the teaching profession, gaining experience in practical pedagogical activity, becoming a professional orientation of their personality
Learning Outcomes
ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.
ON3 Analyze and apply pedagogical and methodological norms and documents in the field of social, professional and scientific communications.
ON4 Apply educational resources and modern media and information technology in the educational process.
Learning outcomes by discipline
1. Demonstrate theoretical knowledge in practice.
2. Own methods of organization of psychological and pedagogical work.
3. Apply training and education methods.
Prerequisites

Pedagogy

Postrequisites

Pedagogical practice

Field training practice

Discipline cycle	Basic disciplines
Course	2
Credits count	2
Knowledge control form	Total mark on practice

Short description of discipline

Educational practice is aimed at studying the basic laws of the ecology of animals and plants in natural conditions. During the educational practice, he makes observations of organisms in nature and laboratory conditions and compares research methods, examines plants and explains scientific ideas about the diversity and systematics of animals, the features of their ecology, owns the method of identifying plants and animals, the skills of naturalistic work and environmental protection.

Purpose of studying of the discipline

The main goal of mastering the discipline is to familiarize students with the diversity of animals and plants of various landscapes in natural conditions and to give students an idea of the basic methods of field biological research, processing and storage of materials.

Learning Outcomes

ON8 Present the results of experimental research work in the form of a report, scientific report, message, conclusions.
ON9 To integrate the main provisions, concepts and laws in the field of chemistry and related natural science disciplines in the explanation of theoretical and practical tasks.

Learning outcomes by discipline

- Describe the main methods of research of animals and plants, the main morphological features of animals and plants, special terminology, the Latin names of the most important classes, families and species of animals and plants, the characteristic features of these taxa, ecological features, practical and biocenotic significance of the most common in educational practice animals and plants;
- To distinguish in the field by their appearance and characteristic traces of the activity of the most typical animals and plants of the local fauna and flora, to determine the systematic position of animals and plants with the help of determinants, to collect animals using various methods and equipment;
- Carry out cameral processing of the collected field material, conduct observations of animals and record them in a field diary, competently conduct excursions into nature, make collections, herbariums of plants, draw up reporting materials.

Prerequisites

School course

Postrequisites

Plant Sistematic

Plant Physiology

Discipline cycle	Basic disciplines
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline

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

Purpose of studying of the discipline

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

Learning Outcomes

ON 6 Systematize theoretical material on fundamental disciplines in the independent search, analysis, and selection of the necessary information, its transformation, preservation, and transmission.
ON7 Demonstrate the theoretical foundations and current trends in the development of biology, using knowledge about the diversity and functioning of biological systems, their diversity and evolution, the level organization of wildlife.

Learning outcomes by discipline

- Acquire knowledge: the study of plant cell organelles; functions of organs (leaf, stem, root); the formation of organic substances, the processes of photosynthesis and respiration; plant growth and development; absorption of water and minerals; plant resistance to adverse environmental conditions; chemical and physiological bases of internal mechanisms.
- Must be able to navigate the processes occurring in plants, the study of general patterns and specific mechanisms underlying the life of plants.
- Understanding of plant regulation systems (intracellular and organismal): genetic, membrane, trophic, hormonal, electrophysiological

Prerequisites

School course

Postrequisites

Basic and profile disciplines of the EP

Methodology of chemistry training

Discipline cycle	Basic disciplines
Course	3

Credits count	5
Knowledge control form	Examination

Short description of discipline
This course provides for the formation of methodological knowledge and skills of future chemistry teachers, preparation for teaching and educational work in chemistry at school. The course is designed to form competencies in the field of conceptual and theoretical foundations of the methods of teaching chemistry, applies the algorithm of pedagogical activity focused on the result of educational work.

Purpose of studying of the discipline
Obtain methodological knowledge and skills, preparation for teaching and educational work in chemistry at school

Learning Outcomes
ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.
ON3 Analyze and apply pedagogical and methodological norms and documents in the field of social, professional and scientific communications.
ON4 Apply educational resources and modern media and information technology in the educational process.

Learning outcomes by discipline
- *To form competencies in the field of conceptual and theoretical foundations of the methods of teaching chemistry;*
- *Explain the methods, approaches and technologies of teaching chemistry to students; methods of pedagogical analysis of the results of observations and experiments;*
- *Apply the algorithm of pedagogical activity, focused on the result of educational work.*

Prerequisites
Pedagogy

Postrequisites
Pedagogical practice

Technologies of the updated content of education and criteria assessment

Discipline cycle	Basic disciplines
Course	3
Credits count	5
Knowledge control form	Examination

Short description of discipline
The course reveals the essence of the concepts "Assessment", "Assessment system", "Evaluation criteria", introduces the content of the new educational standard based on the competency-based approach. As part of the updated content of education, students master the methods of formative assessment, reflection and summative assessment, based on the learning objectives that affect the formation of educational and cognitive competence.

Purpose of studying of the discipline
To study the organizational and pedagogical foundations of criteria-based assessment technology.

Learning Outcomes
ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.
ON3 Analyze and apply pedagogical and methodological norms and documents in the field of social, professional and scientific communications.
ON4 Apply educational resources and modern media and information technology in the educational process.

Learning outcomes by discipline
- *develop general recommendations for the criteria-based assessment of students` achievements;*
- *use the skills and abilities to search for scientific, technical and pedagogical information on the Internet;*
- *apply theoretical knowledge in connection with practice;*

Prerequisites
Pedagogy

Postrequisites
Basic and profile disciplines of the EP

Electronic educational resources

Discipline cycle	Basic disciplines
Course	3
Credits count	5
Knowledge control form	Examination

Short description of discipline
When mastering this discipline, students master the possibilities and areas of application of electronic educational resources in solving professional problems. During the course, students learn modern tools and services for creating digital educational resources, educational websites and electronic courses. He also works with educational platforms, portals and websites and learns to apply the acquired knowledge in the learning process.

Purpose of studying of the discipline
The formation of systematic knowledge in the field of the methodology of using and creating electronic educational resources.

Learning Outcomes
ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.
ON3 Analyze and apply pedagogical and methodological norms and documents in the field of social, professional and scientific communications.
ON4 Apply educational resources and modern media and information technology in the educational process.

Learning outcomes by discipline
- *demonstrate knowledge about information technologies that allow solving educational problems in the educational process.*
- *develop the simplest electronic educational resources using various modern educational technologies and use them in the educational process.*
- *analyze the used electronic educational resources in the educational process.*

Prerequisites
Information and communication technology

Postrequisites
Basic and profile disciplines of the EP

Biology chemistry

Discipline cycle	Basic disciplines
Course	3
Credits count	5
Knowledge control form	Examination

Short description of discipline
This course summarizes knowledge on the most important compounds of the body; considers the mechanisms of their regulation and their role in ensuring the vital activity of the organism. In the course of studying the discipline, students use knowledge about the structure and properties of substances to explain metabolic processes in living organisms.

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

Learning Outcomes
ON8 Present the results of experimental research work in the form of a report, scientific report, message, conclusions.
ON9 To integrate the main provisions, concepts and laws in the field of chemistry and related natural science disciplines in the explanation of theoretical and practical tasks.
ON10 Use natural science terms for professional purposes.

Learning outcomes by discipline
- explain the patterns and possibilities of chemical processes and energy conversion in a living organism;
- describe the mechanisms of regulation of chemical transformations occurring in the body and their role in ensuring life
- integrate the acquired knowledge to solve situational problems;

Prerequisites
Organic chemistry

Postrequisites
Basic and profile disciplines of the EP

Pedagogical practice

Discipline cycle	Basic disciplines
Course	3
Credits count	5
Knowledge control form	Total mark on practice

Short description of discipline
During practical training, students improve the skills necessary for their professional activities and competently apply them in practice. Forms the skills of using modern technologies, combines creative search and theoretical knowledge.

Purpose of studying of the discipline
To master modern technologies of education and upbringing, as well as the possibility of their implementation in school practice: innovative teaching strategies, forms, methods and means of organizing and implementing the educational process.

Learning Outcomes
ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.
ON3 Analyze and apply pedagogical and methodological norms and documents in the field of social, professional and scientific communications.
ON4 Apply educational resources and modern media and information technology in the educational process.

Learning outcomes by discipline
- apply the acquired pedagogical and subject knowledge in practice, transform them into new situations.
- plan and conduct lessons using innovative technologies and active learning methods.
- cooperate with the subjects of the educational process, create a collaborative environment in the school community.

Prerequisites
Basic and profile disciplines of the EP Pedagogical practice (psychological and pedagogical)

Postrequisites
Undergraduate practice Productive (pedagogical) Practice

Forms and methods of organizing STEM training

Discipline cycle	Basic disciplines
Course	4
Credits count	5
Knowledge control form	Examination

Short description of discipline

This course is aimed at the non-traditional application of interdisciplinary knowledge in any industry and any environment to achieve the best result. In the course of studying the discipline, students consider the organization of the project work of schoolchildren, the development and use of heuristic tasks of a natural science nature. They develop spatial thinking through intellectual STEM games, 3D models, etc.

Purpose of studying of the discipline

Meeting the educational needs of future teachers and using a variety of methods and tools, including the integration of research, information society, mathematics, physics, chemistry, biology and technology, available in STEM educational content.

Learning Outcomes

ON8 Present the results of experimental research work in the form of a report, scientific report, message, conclusions.
ON9 To integrate the main provisions, concepts and laws in the field of chemistry and related natural science disciplines in the explanation of theoretical and practical tasks.
ON10 Use natural science terms for professional purposes.

Learning outcomes by discipline

- to enter into communication with the subjects regarding the solution of the educational problem;
- to model the image of future activity (constructive, project, speech, etc.);
- apply creative mechanisms for the implementation of the idea (own products: projects, creative inventions, model, game, etc.

Prerequisites

Pedagogy

Postrequisites

Undergraduate practice

Molecular Biology

Discipline cycle	Profiling discipline
Course	4
Credits count	3
Knowledge control form	Examination

Short description of discipline

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

Purpose of studying of the discipline

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

Learning Outcomes

ON7 Demonstrate the theoretical foundations and current trends in the development of biology, using knowledge about the diversity and functioning of biological systems, their diversity and evolution, the level organization of wildlife.

Learning outcomes by discipline

1. Demonstrate knowledge about the structure and functioning of nucleic acids, cell organoids,
2. analyze the processes of construction and destruction of elements and components of a living cell,
3. explain the molecular mechanisms of heredity and variability;
4. master the methodology of laboratory genetic research at the modern molecular level.

Prerequisites

Human anatomy Biology chemistry

Postrequisites

Undergraduate practice Productive (pedagogical) Practice

Pedagogical experiment and experimental data processing

Discipline cycle	Profiling discipline
Course	4
Credits count	5
Knowledge control form	Examination

Short description of discipline

Teaching this course involves improving the professional training of students in the field of organization, planning of research work, setting up a pedagogical experiment during pedagogical practice. In the course of studying the discipline, the student is able to plan the stages of pedagogical research, master the skills of processing practical data, focus on professional sources of information.

Purpose of studying of the discipline

To carry out professional training of the student in the field of pedagogical experiment.

Learning Outcomes

ON8 Present the results of experimental research work in the form of a report, scientific report, message, conclusions.
ON9 To integrate the main provisions, concepts and laws in the field of chemistry and related natural science disciplines in the explanation of theoretical and practical tasks.
ON10 Use natural science terms for professional purposes.

Learning outcomes by discipline

- To form the skills of assessing the state and fixing the results in experimental groups, taking into account the pedagogical or educational impact of the experiment itself;
- Explain the purpose, functions and tasks of the pedagogical experiment; apply modern research methods;
- Master the skills of processing experimental data and navigate professional sources of information.

Prerequisites

Pedagogy

Postrequisites
Undergraduate practice

Evolutionary biology

Discipline cycle	Profiling discipline
Course	4
Credits count	5
Knowledge control form	Examination

Short description of discipline
This discipline forms knowledge about the heredity and variability of the characteristics of various organisms, adaptability, reproduction and diversity of species in the process of evolutionary development. In the course of mastering the discipline, students receive systematic ideas about the development of ontogenetic processes in the course of evolution, the patterns of evolutionary processes, the ontogenetic basis of homoplasia and homology, global changes in flora and fauna as components of the biosphere. A materialistic view is being formed on the history of the development of wildlife.

Purpose of studying of the discipline
Formation of dialectical- materialistic views of students, increasing the ability of biological thinking, to explain the causes and consequences of natural phenomena.

Learning Outcomes
ON 6 Systematize theoretical material on fundamental disciplines in the independent search, analysis, and selection of the necessary information, its transformation, preservation, and transmission.
ON7 Demonstrate the theoretical foundations and current trends in the development of biology, using knowledge about the diversity and functioning of biological systems, their diversity and evolution, the level organization of wildlife.

Learning outcomes by discipline
- *formulate the main problems of theoretical issues of evolutionary science;*
- *discuss complex materials in modern biology;*
- *analyze theoretical studies on the main problems of evolutionary science*

Prerequisites
Human anatomy

Postrequisites
Undergraduate practice