NJSC SHAKARIM UNIVERSITY OF SEMEY

# EDUCATIONAL PROGRAM

**7M01 - Pedagogical sciences**
(Code and classification of the field of education)

**7M015 - Teacher training in natural science subjects**
(Code and classifcation of the direction of training)

**0114**
(Code in the International Standard Classifcation of Education)

**M014 - Training of teachers of biology (kazakh, russian, english language)**
(Code and classifcation of the educational program group)

**7M01505 - Biology**
(Code and name of the educational program)

**Master**
(Level of preparation)

**Semey**

# Educational program

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Master
(Level of preparation)

Semey 2023

# PREFACE

## Developed

The educational program 7M01505 - Biology in the direction of preparation 7M015 - Teacher training in natural science subjects 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 | Zhandos Mukayev | dean of the Faculty of Natural Sciences and mathematics, PhD | |
| Educational program manager | Sadykova Raigul | senior lecturer of the Department of natural science disciplines, candidate of Agricultural Sciences | |
| Member of the AC | Rakhimzhanova Akgul | head of the Department of natural science disciplines, PhD | |
| Member of the AC | Negmejanova Gulbarshyn | Secondary school №16 T. Amanov KSU, biology teacher | |
| Member of the AC | Toleubaeva Gaukhar | Secondary School of KSU No. 37 Y. Altynsarin, biology teacher | |
| Member of the AC | Turysbekova Aizat | MBE-201, master s student 1st year | |
| Member of the AC | Omerkhanova Gulnara | MBE-201, master s student 1st year | |

## Reviewing

| Full name of the reviewer | Position, place of work | Signature |
|---|---|---|
| Malgazhdarova Zhanat | Director of the municipal state institution | |

## Reviewed

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

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

## Approved

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

## Content

# 1.Introduction

1.1.General data

The Educational Department of Natural Sciences of the Faculty of Natural Mathematics of the Semey University named after Shakarim provides training under the educational program 7M01505 "Biology". Educational program 7M01505 "Biology" is intended for preparation of masters with an in-depth theoretical and practical knowledge in the field of biology education and teaching, have ideas of new directions of modern biology, understanding modern problems of biology and is able to apply the acquired competence in scientific and educational spheres.

1.2.Completion criteria

The main criterion for the completion of the educational process for the preparation of masters of the scientific and pedagogical direction is the development of at least 88 credits of theoretical training, including 6 credits of pedagogical practice, 13 credits of research practice, as well as at least 24 credits of research work of a master`s student, including internships and the completion of a master`s thesis, at least 8 credits of the final attestations . A total of 120 credits.

1.3.Typical study duration: 2 yers

# 2.PASSPORT OF THE EDUCATIONAL PROGRAM

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|---|---|
| **2.1.EP purpose** | Preparation of masters with in-depth, theoretical and practical knowledge in the field of modern areas of biological Sciences and methods of teaching biology, and are able to apply their competencies in the scientific, practical and pedagogical spheres. |
| **2.2.Map of the training profile within the educational program** | |
| Code and classification of the field of education | 7M01 - Pedagogical sciences |
| Code and classification of the direction of training | 7M015 - Teacher training in natural science subjects |
| Code in the International Standard Classification of Education | 0114 |
| Code and classification of the educational program group | M014 - Training of teachers of biology (kazakh, russian, english language) |
| Code and name of the educational program | 7M01505 - Biology |
| **2.3.Qualification characteristics of the graduate** | |
| Degree awarded / qualification | Master of Pedagogical Sciences in the educational program 7M01505 Biology |
| Name of the profession / list of positions of a specialist | Researcher, head of the research group of research institutes and universities of pedagogical profile; teacher of higher education institutions, secondary vocational educational institutions, head of departments and divisions of state educational services. |
| OQF qualification level (industry qualification framework) | 7 |
| Area of professional activity | Research organizations, secondary schools, lyceums, gymnasiums, colleges, national parks and nature reserves. |
| Object of professional activity | Research institutes, as well as institutes of pedagogical profile, higher educational institutions of state and non-state profile. |
| Types of professional activity | Educational (pedagogical), teacher of biology in higher educational institutions of state and non-state profile; research work and work in the field of education and science |
| Graduate Model | The uniqueness of the Educational program<br>Distinctive features and opportunities, uniqueness of the educational program 7M01505– Biology are:<br>- high lecturing skills and mentoring and the availability of basic education of teaching staff;<br>- the use of innovative teaching methods by teachers in the classroom, interdisciplinary training, a local history approach in the study of;<br>- formation of practical skills of undergraduates taking into account the real needs of employers.<br>Acquired competencies expressed in the achieved learning outcomes<br>As a result of studying in this direction, the undergraduate student acquires the following competencies:<br>- is able to demonstrate socio-cultural, economic, legal, environmental knowledge, communicative skills, apply information technologies taking into account |

| | |
|---|---|
| | modern trends in the development of society;<br>- owns modern technologies of teaching and criteria assessment taking into account individual, physiological and psychological characteristics of students and students;<br>- knows the basic provisions, concepts and laws in the field of natural sciences when explaining theoretical and practical tasks;<br>-ready to develop educational resources using modern media and information technologies in the educational process;<br>- a way to demonstrate the results of experimental research work in the form of a report, a scientific report, a message, scientific conclusions;<br>- owns educational material on all issues of the school and university curriculum of biological disciplines for everyday professional activities;<br>- I am ready to interpret information and sources from the point of view of their reliability and scientific character;<br>- knows the patterns of formation of natural complexes and is able to identify the features of interaction between nature and society at the present stage;<br>- is able to apply biological knowledge in pedagogical activity.<br>Personal qualities of the graduate<br>- ability to solve complex problems;<br>- critical thinking;<br>- creative thinking;<br>- ability to work in a team;<br>- the ability to recognize your own and other people`s emotions, manage them;<br>- ability to form judgments and make decisions;<br>- conducting negotiations;<br>- switching from one task to another. |

# 3.Modules and content of the educational program

## Sociolinguistic and scientific-pedagogical activity

## Foreign language (professional)

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |
| SubjectID | 27756 (3011602) |
| Course | 1 |
| Term | 1 |
| Credits count | 3 |
| Practical and seminar classes | 30hours |
| 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

*Mastery of general cultural, professional and special competencies for the implementation of professional activities, involving teaching free reading of original literature of the relevant branch of knowledge in a foreign language; development of oral communication skills in monological and dialogical form in the specialty; development of written scientific communication skills on topics related to the scientific work of a graduate student, as well as familiarization with the forms and types of international cooperation in the scientific field.*

### Purpose of studying of the discipline

*The purpose of studying the discipline "Foreign language (professional)" in the master`s degree program is the systematic deepening of communicative competence within the framework of international standards of foreign language education on the basis of further development of skills and abilities of active language proficiency in the professional activity of the future master.*

### Learning Outcomes

*ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.*

### Prerequisites

*Bachelor*

### Postrequisites

*Research practice*

## History and philosophy of science

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |
| SubjectID | 27750 (3011600) |
| 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 culture of scientific thinking, forms analytical capabilities and research skills, provides theoretical and practical knowledge necessary for a future scientist. Explores the historical evolution of the sciences and the philosophical perspectives they form. The origins of modern science, its social and institutional connections are described. General philosophical issues related to thought experiments, confirmation and refutation of theories, the origin and application of quantitative and high-quality research methods are considered.*

### Purpose of studying of the discipline

*the formation of an interdisciplinary worldview among undergraduates, based on a deep understanding of the history and philosophy (theory) of scientific thinking, as part of a universal culture.*

### Learning Outcomes

*ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.*

### Prerequisites

*Bachelor*

### Postrequisites

*Final examination*

## Tertiary education

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |
| SubjectID | 27754 (3011601) |

| | |
|---|---|
| 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 course is aimed at studying the main directions, principles and patterns of higher education. During the course of the course, the basic concepts of modern pedagogy, concepts and theories of teaching and upbringing, didactics of higher education will be considered. The master`s student will master the skills of designing the organization of the educational process, techniques of individual and group reflection, will be able to correctly formulate pedagogical goals, apply educational technologies in the educational process. in the process, to design work programs of disciplines.*

### Purpose of studying of the discipline

*The purpose of mastering the discipline is to master the system of knowledge about higher education, its content, structure, principles of educational process management and mastering modern technologies in the field of management and organization of the educational process*

### Learning Outcomes

*ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.*

### Prerequisites

*Bachelor*

### Postrequisites

*Pedagogical practice*

## Psychology of management

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |
| SubjectID | 27759 (3011603) |
| 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 content of the course is aimed at mastering the approaches and directions of management psychology, psychological laws of management, features of planning and solving management problems. Students will get acquainted with the psychological methods of resolving conflict situations, master the ways of motivating work, the methods of using effective management styles. Skills will be formed to analyze the psychological causes underlying the decline in the effectiveness of the management process.*

### Purpose of studying of the discipline

*The purpose of the discipline "Psychology of Management" is the formation of scientifically based ideas about the system of mental phenomena, psychological variables of behavior and conscious human activity in modern conditions and allows undergraduates to form skills of applying the acquired psychological knowledge in educational activities*

### Learning Outcomes

*ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.*

### Prerequisites

*Bachelor*

### Postrequisites

*Pedagogical practice*

## Pedagogical practice

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | University component |
| SubjectID | 27802 (3011598) |
| Course | 2 |
| Term | 1 |
| Credits count | 6 |
| Lections | 180hours |
| Total | 180hours |
| Knowledge control form | Total mark on practice |

### Short description of discipline
*Pedagogical practice is an important practical component of the educational program, aimed at consolidating theoretical knowledge and acquiring practical skills and competencies by undergraduates in the process of pedagogical activity. During the course of pedagogical practice, undergraduates master the main functions of pedagogical activity, including the functions of design, construction, organization and socio-psychological regulation, develop knowledge and skills of teaching biological disciplines.*
### Purpose of studying of the discipline
*Consolidation of theoretical knowledge and formation and development of professional knowledge and skills of teaching biological disciplines among undergraduates.*
### Learning Outcomes
*ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.*
### Prerequisites
*Biology teaching technology in secon dary vocational and university*
### Postrequisites
*Final examination*

## Research in biology

## Organization and plan research work

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | University component |
| SubjectID | 27783 (3011573) |
| 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
*This discipline studies the principles of fundamental and applied research. When studying the course, undergraduates form systemic knowledge about scientific areas, about the formulation of the goal and objectives of research in biology, about the tasks of theoretical and experimental research. on the analysis and design of scientific research, on the implementation and effectiveness of scientific research, on the technologies of scientific research, on scientific projects.*
### Purpose of studying of the discipline
*Finding a certain object, studying its structure, characteristics, connections on the basis of positions and methods of cognition developed in science, as well as obtaining important results for human activity.*
### Learning Outcomes
*ON2 Apply knowledge of the theoretical and methodological foundations of scientific research in pedagogy and in a special field. Demonstrate methods of implementing research results into practical pedagogical activity.*
*ON6 To plan and carry out a scientific experiment, to logically argue scientific conclusions.*
### Prerequisites
*History and philosophy of science*
### Postrequisites
*Research practice*

## Research activity of students in biology

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | University component |
| SubjectID | 27801 (3011604) |
| 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
*This course teaches you to ask questions and teaches you to find answers. The introduction of research methods in the teaching of biology helps to increase the motivation for learning. To educate a creative person who is able to independently acquire knowledge and skills, freely use them in their activities. Formation of research literacy: development of the ability to independently analyze and evaluate information of any type and complexity, as well as scientific literature.*
### Purpose of studying of the discipline

*Ensuring a high level of theoretical and practical training of the future teacher in the field of biology as a person who is able to realize the possibilities of the educational environment to achieve learning and upbringing results, taking into account the characteristics and needs of students.*

### Learning Outcomes

*ON2 Apply knowledge of the theoretical and methodological foundations of scientific research in pedagogy and in a special field. Demonstrate methods of implementing research results into practical pedagogical activity.*
*ON5 To predict the results of scientific research in the context of social, economic, environmental consequences of the introduction of scientific results into practice.*

### Prerequisites

*History and philosophy of science*

### Postrequisites

*Final examination*

## The research work of a student, including an internship and the implementation of a master`s thesis I

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | University component |
| SubjectID | 27798 (3011594) |
| Course | 1 |
| Term | 2 |
| Credits count | 11 |
| The research work | 330hours |
| Total | 330hours |
| Knowledge control form | Total mark on practice |

### Short description of discipline

*Research work of a master student of undergraduates is a mandatory component of the educational program, forms professional competencies, organizes training in the theory and practice of conducting scientific research and allows conducting scientific research under the supervision of a supervisor according to assignments. It develops creative thinking among undergraduates, teaches to identify areas and objects of research, as well as to select and systematize information sources on the topic of research.*

### Purpose of studying of the discipline

*To gain practical skills in conducting scientific research; formation of creative thinking and skills to identify areas and objects of research; to select and systematize information sources on the topic of research.*

### Learning Outcomes

*ON5 To predict the results of scientific research in the context of social, economic, environmental consequences of the introduction of scientific results into practice.*
*ON6 To plan and carry out a scientific experiment, to logically argue scientific conclusions.*

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Final examination*

## The research work of a student, including an internship and the implementation of a master``s thesis II

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | University component |
| SubjectID | 27816 (3011599) |
| Course | 2 |
| Term | 1 |
| Credits count | 4 |
| Lections | 120hours |
| Total | 120hours |
| Knowledge control form | Total mark on practice |

### Short description of discipline

*Research work is a prerequisite for the preparation of undergraduates. It is aimed at the formation of professional skills through the independent organization and conduct of scientific research, the ability to extract scientific information and analyze it, the choice of priority and relevant research methods that allow obtaining reliable material. Allows you to implement the practical skills of writing scientific articles and to carry out analytical work in the processing of research materials.*

### Purpose of studying of the discipline

*Formation of professional skills of independent organization and conduct of scientific research; skills of writing scientific articles and conducting analytical work when processing research materials.*

### Learning Outcomes

*ON2 Apply knowledge of the theoretical and methodological foundations of scientific research in pedagogy and in a special field. Demonstrate methods of implementing research results into practical pedagogical activity.*
*ON5 To predict the results of scientific research in the context of social, economic, environmental consequences of the introduction of scientific results into practice.*

*ON6 To plan and carry out a scientific experiment, to logically argue scientific conclusions.*

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Final examination*

## Research practice

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | University component |
| SubjectID | 27820 (3011593) |
| Course | 2 |
| Term | 2 |
| Credits count | 13 |
| Working practice | 390hours |
| Total | 390hours |
| Knowledge control form | Total mark on practice |

### Short description of discipline

*Research practice is an integral part of the main educational program of the master`s program. Research practice in the field of master`s degree in pedagogical sciences is aimed at the formation and improvement of the research competencies of undergraduates in the field of experimental work on a master`s thesis, as well as the use of diagnostic methods. research,scientific articles, textbooks.*

### Purpose of studying of the discipline

*The purpose of the research practice is the acquisition, development and application of professional knowledge in the chosen field of study and in the course of working on a dissertation.*

### Learning Outcomes

*ON2 Apply knowledge of the theoretical and methodological foundations of scientific research in pedagogy and in a special field. Demonstrate methods of implementing research results into practical pedagogical activity.*
*ON5 To predict the results of scientific research in the context of social, economic, environmental consequences of the introduction of scientific results into practice.*
*ON6 To plan and carry out a scientific experiment, to logically argue scientific conclusions.*

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Final examination*

## The research work of a student, including an internship and the implementation of a master``s thesis III

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|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | University component |
| SubjectID | 27821 (3011609) |
| Course | 2 |
| Term | 2 |
| Credits count | 9 |
| The research work | 270hours |
| Total | 270hours |
| Knowledge control form | Total mark on practice |

### Short description of discipline

*Research work allows you to consolidate, systematize and expand knowledge of the latest scientific achievements in the field of biology and teaching methods. Develops the ability to formulate and solve scientific problems, increasing the level of research competence of the undergraduate. Forms scientific thinking, a clear idea of the subject and the main professional tasks and ways to solve them. Teaches methods of conducting bibliographic work on the basis of modern information technologies.*

### Purpose of studying of the discipline

*Forms the skills of solving scientific problems, setting professional tasks and finding ways to solve them. Teaches methods of conducting bibliographic work based on modern information technologies.*

### Learning Outcomes

*ON6 To plan and carry out a scientific experiment, to logically argue scientific conclusions.*
*ON7 To use the acquired knowledge and skills to solve topical environmental, economic and social problems.*
*ON8 Critically analyze existing concepts, theories and approaches to the analysis of processes and phenomena, integrate knowledge gained in different disciplines to solve research problems in new unfamiliar conditions.*

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Final examination*

## Evolutionary biology

## Development biology

| | |
|---|---|
| Discipline cycle | Basic disciplines |

| | |
|---|---|
| Discipline component | Electives |
| SubjectID | 27733 (3011579) |
| 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 examines the processes of individual development (ontogenesis) of plant and animal organisms, formative processes during the period of individual development of the organism in space and time, explores the genetic, molecular and biochemical mechanisms of metabolism in cells and tissues in the process of formation, studies the features of cellular and subcellular levels of organization of living organisms. Studies aspects of the development process at the molecular, cellular, tissue, organ and organizational levels.*

### Purpose of studying of the discipline
*Establishment and substantiation of the features of the composition and structure of various cells of the body.*

### Learning Outcomes
*ON3 Demonstrate an understanding of modern biosphere processes, the ability to systematically assess them, the ability to predict the implementation of socially significant projects.*
*ON7 To use the acquired knowledge and skills to solve topical environmental, economic and social problems.*

### Prerequisites
*Bachelor*

### Postrequisites
*Evolution Biology*

## The modern problems of biology

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 27732 (3011578) |
| 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 studies the empirical and theoretical levels of cognition, is aimed at the formation of theoretical knowledge in the discipline and is the basis for practical classes, during which undergraduates work out research skills, solving practical problems and master the basics of scientific work.*
*Topics from related disciplines are considered, knowledge of which is necessary for understanding general biological laws, concepts of modern natural science, theory of evolution and genetics related to conceptual biological disciplines*

### Purpose of studying of the discipline
*to obtain basic knowledge about the main areas of research currently being conducted by biologists, about the problems of obtaining reliable information using experimental and epidemiological studies*

### Learning Outcomes
*ON3 Demonstrate an understanding of modern biosphere processes, the ability to systematically assess them, the ability to predict the implementation of socially significant projects.*
*ON7 To use the acquired knowledge and skills to solve topical environmental, economic and social problems.*

### Prerequisites
*Bachelor*

### Postrequisites
*Evolution Biology*

## Modern problems of human biology

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 27761 (3011605) |
| 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 covers a wide range of issues and is represented by three modules.*
*The first reveals the biological and social essence of man. Theories of social Darwinism, the ecology of social consciousness, the role of the environment in the development of the human psyche are considered.*
*The second module is devoted to anthropogenesis and human environments, geographic polymorphism and polytypes.*
*The third module examines human interaction with the environment and the role of environmental and hygienic factors.*

### Purpose of studying of the discipline

*Familiarization with current problems and promising areas of biology*

### Learning Outcomes

*ON3 Demonstrate an understanding of modern biosphere processes, the ability to systematically assess them, the ability to predict the implementation of socially significant projects.*
*ON7 To use the acquired knowledge and skills to solve topical environmental, economic and social problems.*

### Prerequisites

*Bachelor*

### Postrequisites

*Physiology of the central nervous system and higher nervous activity*

## Modern problems of human physiology

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 27734 (3011583) |
| 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 issues of the vital activity of the human body as a single integral system regulated by neuro-humoral mechanisms are considered; features of adaptation in global environmental conditions; the mechanisms of human resistance to environmental stressors are clarified; the role of various levels of the central nervous system in the formation and regulation of emotional states and the elucidation of the mechanisms of mental activity that ensure the integrative functions of the human brain.*

### Purpose of studying of the discipline

*Study of current problems and promising areas of human physiology*

### Learning Outcomes

*ON3 Demonstrate an understanding of modern biosphere processes, the ability to systematically assess them, the ability to predict the implementation of socially significant projects.*
*ON7 To use the acquired knowledge and skills to solve topical environmental, economic and social problems.*

### Prerequisites

*Bachelor*

### Postrequisites

*Physiology of the central nervous system and higher nervous activity*

## Theoretical Biology

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 27365 (3011577) |
| 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
*Theoretical biology develops biological thinking among undergraduates and forms a scientific worldview. The course reveals the multidimensionality of the levels of organization of living matter, the principle of stable disequilibrium of biological systems, the specifics of the biological form of motion of matter. Special attention is paid to the biological picture of the world, the systematic organization of biological objects and methods of studying theoretical biology, the interaction of theoretical biology with other sciences. Theoretical biology develops biological thinking among undergraduates and forms a scientific worldview. The course reveals the multidimensionality of the levels of organization of living matter, the principle of stable disequilibrium of biological systems, the specifics of the biological form of motion of matter. Special attention is paid to the biological picture of the world, the systematic organization of biological objects and methods of studying theoretical biology, the interaction of theoretical biology with other sciences.*

### Purpose of studying of the discipline
*To acquaint with history of theoretical biology, its development as sciences, its main concepts, to show its place in system of the modern biological disciplines, and also its role in formation of the modern views in biology*

### Learning Outcomes
*ON3 Demonstrate an understanding of modern biosphere processes, the ability to systematically assess them, the ability to predict the implementation of socially significant projects.*
*ON7 To use the acquired knowledge and skills to solve topical environmental, economic and social problems.*

### Prerequisites
*Bachelor*

### Postrequisites
*Evolution Biology*

## Ecological human physiology

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 27742 (3011584) |
| 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 studies the features of the life of the human body and the mechanisms of its adaptation in a constantly changing environment, the dependence of the functions of organs and physiological systems on the effects of environmental factors in various physical and geographical zones, natural cycles. The impact on the human body of working and living conditions, increasing physical and emotional-psychological stress, as well as stressful situations is considered.*

### Purpose of studying of the discipline
*To study the peculiarities of the human body`s vital activity and the mechanisms of its adaptation to the environment*

### Learning Outcomes
*ON3 Demonstrate an understanding of modern biosphere processes, the ability to systematically assess them, the ability to predict the implementation of socially significant projects.*
*ON7 To use the acquired knowledge and skills to solve topical environmental, economic and social problems.*

### Prerequisites
*Bachelor*

### Postrequisites
*Physiology of the central nervous system and higher nervous activity*

## Actual problems of genetics

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 27792 (3011585) |
| 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 course examines the molecular genetic foundations of heredity, chromosomal polymorphism in the human population, genetic monitoring of the human population due to environmental pollution, prevention and occurrence of hereditary diseases, polymorphism of the human immune system, issues of genetic safety, issues of genetic toxicology, problems of cloning, DNA methylation, PCR assays and issues of the use of chemicals and radiation in plant breeding.*

### Purpose of studying of the discipline

*To study the current state of genetics and the solution of existing genetic problems*

### Learning Outcomes

*ON3 Demonstrate an understanding of modern biosphere processes, the ability to systematically assess them, the ability to predict the implementation of socially significant projects.*
*ON7 To use the acquired knowledge and skills to solve topical environmental, economic and social problems.*

### Prerequisites

*Bachelor*

### Postrequisites

*Evolution Biology*

## New approaches to teaching

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 27791 (3011582) |
| 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 course provides features of the methodology of joint group work, discussion, presentation and individual research, new approaches in teaching and learning within the framework of seven modules. He reveals the technology of dialogic learning, since dialogue occupies a central place in the lesson and can contribute to the intellectual development of students and their effectiveness in learning. In the technology of developing critical thinking, great importance is attached to methods that form the ability to work with questions.*

### Purpose of studying of the discipline

*to provide in-depth theoretical knowledge about the learning process and about students;*
*- to develop practical teaching skills; to expand the range of methodological and didactic approaches in teaching; to improve competencies in the field of lesson planning;*

### Learning Outcomes

*ON2 Apply knowledge of the theoretical and methodological foundations of scientific research in pedagogy and in a special field. Demonstrate methods of implementing research results into practical pedagogical activity.*
*ON8 Critically analyze existing concepts, theories and approaches to the analysis of processes and phenomena, integrate knowledge gained in different disciplines to solve research problems in new unfamiliar conditions.*

### Prerequisites

*Bachelor*

### Postrequisites

*Pedagogical practice*

## Human Genetics

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 27795 (3011586) |
| 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 course examines the main methods of studying human genetics: genealogical method, twin method, population-statistical method, cytogenetic method. The issues of the influence of environmental factors on heredity and variability in the human population, problems and prevention of mutagenesis are studied. During the course, undergraduates will be able to better understand the cause-and-effect relationships of biological processes in nature, explain the patterns and mechanisms of variability of signs.*

### Purpose of studying of the discipline

*To study the patterns of inheritance and variability of traits in humans*

### Learning Outcomes

*ON3 Demonstrate an understanding of modern biosphere processes, the ability to systematically assess them, the ability to predict the implementation of socially significant projects.*
*ON7 To use the acquired knowledge and skills to solve topical environmental, economic and social problems.*

### Prerequisites

*Bachelor*

### Postrequisites

*Evolution Biology*

## Population Genetics

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 27797 (3011587) |
| 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 course examines the history of the concept of "population", the modern definition of population. undergraduates will study the features of the genetic structure of the population, population-genetic processes: gene drift, mutations, migrations, crossing systems. The connection between population genetics and evolution, the Hardy– Weinberg law – the basic law of population genetics, genetic polymorphism of populations as the basis of biological diversity and the problems of biodiversity conservation are also considered, which contributes to the development of analytical thinking in revealing the issues of understanding evolution at the present stage*

### Purpose of studying of the discipline

*To study the history of the development of the concept of population and modern evolutionary and genetic processes*

### Learning Outcomes

*ON3 Demonstrate an understanding of modern biosphere processes, the ability to systematically assess them, the ability to predict the implementation of socially significant projects.*
*ON7 To use the acquired knowledge and skills to solve topical environmental, economic and social problems.*

### Prerequisites

*Bachelor*

### Postrequisites

*Evolution Biology*

## Professional teacher landmark

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 27790 (3011581) |
| 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 considers the targets of higher education in modern educational paradigms, the axiological component of the professional image of a teacher,*
*the values and meanings of pedagogical activity, the methodological component of the professional image of a teacher. Professional and personal development of a teacher in the context of his professional image*

### Purpose of studying of the discipline

*Preparation of a master `s student for teaching at a university and the creation of conditions for the formation of his professional image .*

### Learning Outcomes

*ON2 Apply knowledge of the theoretical and methodological foundations of scientific research in pedagogy and in a special field. Demonstrate methods of implementing research results into practical pedagogical activity.*
*ON8 Critically analyze existing concepts, theories and approaches to the analysis of processes and phenomena, integrate knowledge gained in different disciplines to solve research problems in new unfamiliar conditions.*

### Prerequisites

*Bachelor*

### Postrequisites

*Pedagogical practice*

## Biology teaching technology in secon dary vocational and university

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 27787 (3011580) |
| 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 course is aimed at developing undergraduates` theoretical knowledge and practical skills, the ability to organize pedagogical work and scientific work for the correct selection and processing of educational material necessary for conducting classes, consistent and accessible presentation of its scope and content to students in the process of teaching biology at universities and colleges. The focus is on the development of independent cognitive activity of students in the process of teaching biology.*

### Purpose of studying of the discipline

*Reveal the conceptual basis of active learning biology in high school and post-secondary educational institutions.*

### Learning Outcomes

*ON2 Apply knowledge of the theoretical and methodological foundations of scientific research in pedagogy and in a special field. Demonstrate methods of implementing research results into practical pedagogical activity.*
*ON8 Critically analyze existing concepts, theories and approaches to the analysis of processes and phenomena, integrate knowledge gained in different disciplines to solve research problems in new unfamiliar conditions.*

### Prerequisites

*Bachelor*

### Postrequisites

*Pedagogical practice*

## Anthropology

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 27818 (3011607) |
| 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

*After studying this course, the undergraduate will master the knowledge of anthropology and develop the skills to apply them in a future career. The course is aimed at developing the knowledge, skills and abilities of undergraduates in anthropology and developing the relevant professional and personal qualities of a manager. The course program takes into account the specifics of the future professional activity of undergraduates. The subject is aimed at understanding and deep understanding of the philosophical concepts of natural science, understanding its place in the development of natural sciences.*

### Purpose of studying of the discipline

*The purpose of studying the subject of "Anthropology" is to form an understanding of the formation of human and human phenomena.*

### Learning Outcomes

*ON3 Demonstrate an understanding of modern biosphere processes, the ability to systematically assess them, the ability to predict the implementation of socially significant projects.*
*ON4 To explain the role of evolutionary theory in the biological worldview, to have modern ideas about the basics of evolutionary theory, about micro- and macroevolution.*

### Prerequisites

*Bachelor*

### Postrequisites

*Evolution Biology*

## Bionic

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 27804 (3011572) |
| 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
*In the course of studying this discipline, undergraduates learn additional information about the structure, functions of living organisms, their interaction with each other and with the environment, get acquainted with interesting facts about the invention of various technical devices, and try to consider them from the other side. The course uses knowledge on topics: laws of conservation and transformation of energy, mechanical properties of bodies, capillary phenomena, sound phenomena, environmental protection.*

### Purpose of studying of the discipline
*to show the importance of biological knowledge for the development of technology, architecture, instrumentation, to form in students a scientifically based understanding of the world, the ability to analyze facts and identify cause-and-effect relationships.*

### Learning Outcomes
*ON3 Demonstrate an understanding of modern biosphere processes, the ability to systematically assess them, the ability to predict the implementation of socially significant projects.*
*ON4 To explain the role of evolutionary theory in the biological worldview, to have modern ideas about the basics of evolutionary theory, about micro- and macroevolution.*

### Prerequisites
*Bachelor*

### Postrequisites
*Evolution Biology*

## Biochemistry and physiology of plants

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 27817 (3011606) |
| 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
*Physiology and biochemistry study the life processes of plants, the functions of the plant organism, the chemical composition, changes in substances and all possible energy in the environmental conditions in the process of plant ontogenesis. This is possible only with deep knowledge of the plant organism, anatomy, plant morphology, physics of inorganic, organic and physical colloids, chemistry and other subjects.*

### Purpose of studying of the discipline
*Physiology and biochemistry of plants, relying on regularities, improve the theoretical foundations of growth and development.*

### Learning Outcomes
*ON3 Demonstrate an understanding of modern biosphere processes, the ability to systematically assess them, the ability to predict the implementation of socially significant projects.*
*ON4 To explain the role of evolutionary theory in the biological worldview, to have modern ideas about the basics of evolutionary theory, about micro- and macroevolution.*

### Prerequisites
*Bachelor*

### Postrequisites
*Evolution Biology*

## Population biology and evolution

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 30894 (3011576) |
| 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 studies the biology of a population, and the role of a population in evolution. When studying the course, students develop systemic knowledge about the structure, age, abundance, population density, about general biological, demographic, ecological, genetic study of populations of organisms, about their changes and interactions, in particular, about the study of population aspects of ecology, evolution, reproduction processes, about the emergence of new properties of organisms and their consolidation through natural selection.*

### Purpose of studying of the discipline
*Formation of ideas about the population standard of living*

### Learning Outcomes
*ON3 Demonstrate an understanding of modern biosphere processes, the ability to systematically assess them, the ability to predict the implementation of socially significant projects.*
*ON4 To explain the role of evolutionary theory in the biological worldview, to have modern ideas about the basics of evolutionary theory, about micro- and macroevolution.*

### Prerequisites
*Invertebrates of Kazakhstan*

### Postrequisites
*Final examination*

## Physiology of the central nervous system and higher nervous activity

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 27812 (3011595) |
| 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 studies the functions of the central nervous system and its higher structures, the cerebral cortex, which provide the most complex relations of the human body with the external environment. The activity of the cerebral cortex is based on the activity of subcortical structures that maintain homeostasis. The integrative function of the brain ensures the individuality of adaptation to environmental conditions, the neurophysiological mechanisms of mental activity, the psyche and human behavior.*

### Purpose of studying of the discipline
*To study the role of the central nervous system and higher nervous activity in ensuring the mental and mental activity of a person and his interaction with the environment.*

### Learning Outcomes
*ON3 Demonstrate an understanding of modern biosphere processes, the ability to systematically assess them, the ability to predict the implementation of socially significant projects.*
*ON4 To explain the role of evolutionary theory in the biological worldview, to have modern ideas about the basics of evolutionary theory, about micro- and macroevolution.*

### Prerequisites
*Modern problems of human physiology*

### Postrequisites
*Evolution Biology*

## Behavior physiology

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 27814 (3011597) |
| 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
*Modern ideas about the physiology of higher nervous activity, which provide patterns of behavior, are considered. The behavior of humans and animals is an integral indicator of mental activity aimed at meeting physiological, biological, social and psychological needs and is purposeful, providing the body with normal life.*
*Compensatory mechanisms of disturbed functions of the body are explained from the position of the theory of "functional system" P.K. Anokhin.*

### Purpose of studying of the discipline
*To study the physiological patterns of human behavior on the basis of modern concepts of the physiology of higher nervous activity*

### Learning Outcomes
*ON3 Demonstrate an understanding of modern biosphere processes, the ability to systematically assess them, the ability to predict the implementation of socially significant projects.*
*ON4 To explain the role of evolutionary theory in the biological worldview, to have modern ideas about the basics of evolutionary theory, about micro- and macroevolution.*

### Prerequisites
*Modern problems of human physiology*

### Postrequisites
*Evolution Biology*

## Physiology of sensory systems

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 27819 (3011608) |
| 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
*Sensory systems are considered as "information inputs" to the nervous system, being its subsystems, they perceive influences from the external and internal environment. The principles of structure and function are studied from the standpoint of I.P. Pavlov`s teachings about analyzers. The role of sensory systems in the formation of subjective sensations on the basis of objective stimuli (perceptions and images), in adaptations to stimuli is revealed.*

### Purpose of studying of the discipline
*To study the principles of the structure and function of sensory systems, as well as their role in the formation of subjective sensations*

### Learning Outcomes
*ON3 Demonstrate an understanding of modern biosphere processes, the ability to systematically assess them, the ability to predict the implementation of socially significant projects.*
*ON4 To explain the role of evolutionary theory in the biological worldview, to have modern ideas about the basics of evolutionary theory, about micro- and macroevolution.*

### Prerequisites
*Modern problems of human physiology*

### Postrequisites
*Evolution Biology*

## Evolution Biology

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 27805 (3011574) |
| Course | 2 |
| Term | 1 |
| Credits count | 5 |
| Lections | 15hours |
| Practical and seminar classes | 30hours |
| Independent work of a student under the guidance of a teacher | 35hours |
| Independent work of the student | 70hours |
| Total | 150hours |

| | |
|---|---|
| Knowledge control form | Examination |

### Short description of discipline
*This course examines the theory of evolution, the use of breeding methods, biogeography to prove the evolutionary process. . When considering the discipline, undergraduates fix deep issues of comparative morphology, development and paleozoology, about the main provisions and mechanisms of evolution, about complicating the organization of life, about the analysis of two selections, about neo-Lamarckism and its varieties, about the problems of anthropology, about the problems of the evolutionary process.*

### Purpose of studying of the discipline
*Formation of dialectically materialistic views among undergraduates, increasing the ability to biological thinking, training undergraduates in research work, explanation of cause-and-effect relationships of natural phenomena.*

### Learning Outcomes
*ON3 Demonstrate an understanding of modern biosphere processes, the ability to systematically assess them, the ability to predict the implementation of socially significant projects.*
*ON4 To explain the role of evolutionary theory in the biological worldview, to have modern ideas about the basics of evolutionary theory, about micro- and macroevolution.*

### Prerequisites
*Invertebrates of Kazakhstan*

### Postrequisites
*Final examination*

## Evolution of life

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 27807 (3011575) |
| 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 studies the form of movement, the development of matter, the modes of existence of protein bodies with nucleic acids. When studying the course, students develop systemic knowledge about the Earth as the only planet on which life exists, about various hypotheses for the appearance of life on Earth, about metabolism, about the appearance of plants and animals, about the emergence of man, about the importance of photosynthesis, about the division of organisms into autotrophs and heterotrophs.*

### Purpose of studying of the discipline
*The purpose of teaching the theory of evolution is to form undergraduates a clear understanding of the factors, driving forces and laws of the evolutionary process, a materialistic worldview, an understanding of the relationship of the theory of evolution with their chosen special field of biology.*

### Learning Outcomes
*ON3 Demonstrate an understanding of modern biosphere processes, the ability to systematically assess them, the ability to predict the implementation of socially significant projects.*
*ON4 To explain the role of evolutionary theory in the biological worldview, to have modern ideas about the basics of evolutionary theory, about micro- and macroevolution.*

### Prerequisites
*Invertebrates of Kazakhstan*

### Postrequisites
*Final examination*

## Flora and fauna of Kazakhstan

## Herpetofauna Of Kazakhstan

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 27747 (3011589) |
| 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
*This subject provides for the study of amphibians and reptiles of the Republic of Kazakhstan. With a deep study of the discipline, undergraduates develop clear knowledge about the distribution of these animals on the territory of Kazakhstan, also about taxonomy, the ecology of frogs, snakes, lizards, also about useful species of this group, about the species conservation of amphibians and reptiles of the republic, a description of the more common species of reptiles and amphibians.*
### Purpose of studying of the discipline
*To know the representatives of the herpetofauna of Kazakhstan, their distribution, ecology.*
### Learning Outcomes
*ON4 To explain the role of evolutionary theory in the biological worldview, to have modern ideas about the basics of evolutionary theory, about micro- and macroevolution.*
*ON7 To use the acquired knowledge and skills to solve topical environmental, economic and social problems.*
### Prerequisites
*Bachelor*
### Postrequisites
*Evolution Biology*

## Ichthyofauna Of Kazakhstan

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 27745 (3011588) |
| 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
*This discipline provides for the study of the ichthyofauna, i.e. fish of Kazakhstan. When studying the course, undergraduates form systemic knowledge about the species composition of fish, about the distribution of fish in various reservoirs of Kazakhstan, also about the importance, use and ecology of fish, also about rare and endangered species of fish, about the conservation of valuable fish and the ichthyofauna of Kazakhstan widely used for commercial purposes , as well as knowledge about the scientific work of ichthyologists in Kazakhstan.*
### Purpose of studying of the discipline
*To assess the current state of fish stocks in Kazakhstan`s reservoirs and to know recommendations for their sustainable use while preserving the biological diversity of the ichthyofauna.*
### Learning Outcomes
*ON4 To explain the role of evolutionary theory in the biological worldview, to have modern ideas about the basics of evolutionary theory, about micro- and macroevolution.*
*ON7 To use the acquired knowledge and skills to solve topical environmental, economic and social problems.*
### Prerequisites
*Bachelor*
### Postrequisites
*Evolution Biology*

## Invertebrates of Kazakhstan

| | |
|---|---|
| Discipline cycle | Basic disciplines |
| Discipline component | Electives |
| SubjectID | 27749 (3011596) |
| 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
*This discipline deals with the study of widespread groups of animals - invertebrates. These animals include protists, cholerates, snails and bivalves, free-living and parasitic worms of humans and farm animals, higher and lower crayfish and arachnids, six-legged, which are found in different ecological niches. The discipline includes consideration of the works of entomologists of Kazakhstan, undergraduates get acquainted with various scientific literature and determinants.*
### Purpose of studying of the discipline

*In the course of studying the discipline invertebrates of Kazakhstan, undergraduates should know the biodiversity of invertebrates of Kazakhstan, their importance in nature and human life, the areas of their distribution.*

### Learning Outcomes

*ON4 To explain the role of evolutionary theory in the biological worldview, to have modern ideas about the basics of evolutionary theory, about micro- and macroevolution.*
*ON7 To use the acquired knowledge and skills to solve topical environmental, economic and social problems.*

### Prerequisites

*Bachelor*

### Postrequisites

*Evolution Biology*

## Decorative plant growing

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 27811 (3011592) |
| 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 includes the main branches – floriculture and decorative arboriculture. When studying the course, the issues of plant assortment, agrotechnics of growing the most important flower crops are considered. In the direction of Floriculture, it is important to study the purpose, structure of production areas of greenhouses, greenhouses, and to consider the work carried out in these places, and about the origin of floral and ornamental plants used in the creation of landscape architecture objects;*

### Purpose of studying of the discipline

*formation of advanced professional knowledge and competencies among undergraduates, acquisition of skills and abilities in the field of ornamental plant growing and floriculture for the creation and reconstruction of flower beds, landscapes and interiors for various purposes.*

### Learning Outcomes

*ON4 To explain the role of evolutionary theory in the biological worldview, to have modern ideas about the basics of evolutionary theory, about micro- and macroevolution.*
*ON8 Critically analyze existing concepts, theories and approaches to the analysis of processes and phenomena, integrate knowledge gained in different disciplines to solve research problems in new unfamiliar conditions.*

### Prerequisites

*Bachelor*

### Postrequisites

*Evolution Biology*

## Forage plants

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 27809 (3011591) |
| 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 related to the study of forage plants growing on the territory of Kazakhstan. Considers morphobiological features, fodder and technical value, progressive technologies of cultivation of fodder and industrial crops in field and hay-pasture crop rotation, various systematic groups of plants used in forage production. The problems of protection and rational use of fodder plants in Kazakhstan are studied. Helps undergraduates to identify the main agricultural crops, develop tillage systems.*

### Purpose of studying of the discipline

*to form a system of knowledge, skills and abilities among undergraduates in accordance with the competencies being formed about the importance and creation of a feed base for animal husbandry, modern technologies for preparing feed, improving and exploiting natural lands.*

### Learning Outcomes

*ON4 To explain the role of evolutionary theory in the biological worldview, to have modern ideas about the basics of evolutionary theory, about micro- and macroevolution.*
*ON8 Critically analyze existing concepts, theories and approaches to the analysis of processes and phenomena, integrate knowledge gained in different disciplines to solve research problems in new unfamiliar conditions.*

### Prerequisites
*Bachelor*

### Postrequisites
*Evolution Biology*

## Herb plants in Kazakhstan

| | |
|---|---|
| Discipline cycle | Profiling discipline |
| Discipline component | Electives |
| SubjectID | 27808 (3011590) |
| 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 regional in nature, it presents medicinal plants that are common in Kazakhstan and play an important role in research practice. The relevance and necessity of introducing the discipline lies in the acquisition of knowledge by undergraduates about these plants. Many of them are of great medical and economic importance as sources of medicinal, food, tanning, aromatic, dyeing and other substances.*

### Purpose of studying of the discipline
*deepening knowledge about medicinal plants and mastering the skills of searching for them in various phytocenoses, as well as acquiring the necessary skills for growing medicinal plants and caring for them.*

### Learning Outcomes
*ON4 To explain the role of evolutionary theory in the biological worldview, to have modern ideas about the basics of evolutionary theory, about micro- and macroevolution.*
*ON8 Critically analyze existing concepts, theories and approaches to the analysis of processes and phenomena, integrate knowledge gained in different disciplines to solve research problems in new unfamiliar conditions.*

### Prerequisites
*Bachelor*

### Postrequisites
*Evolution Biology*

## Final assessment

## Master`s dissertation

| | |
|---|---|
| Credits count | 8 |

# 4.Summary table on the scope of the educational program

# «7M01505 - Biology»

| Name of discipline | Cycle/ Component | Term | Number of credits | Total hours | Lec | SPL | LC | IWST | IWS | Knowledge control form |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sociolinguistic and scientific-pedagogical activity** | | | | | | | | | | |
| Foreign language (professional) | BS/US | 1 | 3 | 90 | | 30 | | 20 | 40 | Examination |
| History and philosophy of science | BS/US | 1 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Tertiary education | BS/US | 1 | 3 | 90 | 15 | 15 | | 20 | 40 | Examination |
| Psychology of management | BS/US | 1 | 3 | 90 | 15 | 15 | | 20 | 40 | Examination |
| Pedagogical practice | BS/US | 3 | 6 | 180 | 180 | | | | | Total mark on practice |
| **Research in biology** | | | | | | | | | | |
| Organization and plan research work | AS/US | 2 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Research activity of students in biology | AS/US | 2 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| The research work of a student, including an internship and the implementation of a master`s thesis I | AS/US | 2 | 11 | 330 | | | | | | Total mark on practice |
| The research work of a student, including an internship and the implementation of a master``s thesis II | AS/US | 3 | 4 | 120 | 120 | | | | | Total mark on practice |
| Research practice | AS/US | 4 | 13 | 390 | | | | | | Total mark on practice |
| The research work of a student, including an internship and the implementation of a master``s thesis III | AS/US | 4 | 9 | 270 | | | | | | Total mark on practice |
| **Evolutionary biology** | | | | | | | | | | |
| Development biology | BS/CCh | 1 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| The modern problems of biology | BS/CCh | 1 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Modern problems of human biology | BS/CCh | 1 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Modern problems of human physiology | BS/CCh | 1 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Theoretical Biology | BS/CCh | 1 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Ecological human physiology | BS/CCh | 1 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Actual problems of genetics | AS/CCh | 2 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| New approaches to teaching | AS/CCh | 2 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Human Genetics | AS/CCh | 2 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Population Genetics | AS/CCh | 2 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Professional teacher landmark | AS/CCh | 2 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Biology teaching technology in secon dary vocational and university | AS/CCh | 2 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Anthropology | AS/CCh | 3 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Bionic | AS/CCh | 3 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Biochemistry and physiology of plants | AS/CCh | 3 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Population biology and evolution | AS/CCh | 3 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Physiology of the central nervous system and higher nervous activity | AS/CCh | 3 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Behavior physiology | AS/CCh | 3 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Physiology of sensory systems | AS/CCh | 3 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Evolution Biology | AS/CCh | 3 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Evolution of life | AS/CCh | 3 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| **Flora and fauna of Kazakhstan** | | | | | | | | | | |
| Herpetofauna Of Kazakhstan | BS/CCh | 1 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Ichthyofauna Of Kazakhstan | BS/CCh | 1 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Invertebrates of Kazakhstan | BS/CCh | 1 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Decorative plant growing | AS/CCh | 3 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Forage plants | AS/CCh | 3 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| Herb plants in Kazakhstan | AS/CCh | 3 | 5 | 150 | 15 | 30 | | 35 | 70 | Examination |
| **Final assessment** | | | | | | | | | | |
| Master`s dissertation | | 4 | 8 | 240 | | | | | | |