

6B01509– Biology
Catalog of elective disciplines

1. OPTIONAL COMPONENTS OF THE CYCLE OF CORE COURSES

Optional component 1

Course: Zoology of Invertebrates

Intensity of the Course: 6 academic credits

Module Code: **BPA 102/1**

Module Name: Biodiversity of plants and animals

Prerequisites: Plant Anatomy and Morphology

Purpose: knows the diversity of invertebrates, their adaptation to the environment, features of structure and development, distribution, patterns of historical development.

Short Description: On the course, students systematize invertebrates. He studies their evolution and phylogenetic relationships, vital activity, distribution in the environment. Characterizes and compares the external and internal structure, metabolic processes, development, reproduction features of invertebrates. Works with animals in natural and fixative fluids. Ability to work with laboratory equipment.

Learning Outcomes in EP (LOP):

LO 4 - Apply the principles of distribution, systematization, evolution and phylogenetic relationships of plants, animals and microorganisms in the environment in the learning process;

LO 5 - Distinguishes knowledge gained in the learning process, including structural, functional features of the development of living organisms

LO 6 - Determines the goals and principles of the study, is able to make scientifically based decisions based on the results of biological experiments, clearly formulates the conclusions of the results;

Learning Outcomes in Course (LOC):

LOC 1- Systematizes the modern system of invertebrates

LOC 2- Knows the main and main sections of invertebrate Zoology;

LOC 3- Effectively uses the acquired knowledge for further study of biological disciplines

LOC 4- Can identify the main groups of invertebrates

LOC 5- Works with visual AIDS, animals in natural and fixed fluids, models, tables, diagrams, laboratory equipment, microscopic equipment

Post requisites: Zoology of Vertebrates

Optional component 1

Course: Entomology

Intensity of the Course: 6 academic credits

Module Code: **BPA 102/2**

Module Name: Biodiversity of plants and animals

Prerequisites: Plant anatomy and morphology

Purpose: knows the origin, systematics, morphological and anatomical features of the structure, biology and useful, harmful insects.

Short Description: In the discipline Entomology, students study the origin, systematics, morphological and anatomical features of the structure, biology, ecological features of the growth and development of insects, their practical significance. Knows the types of useful and harmful insects and how to use them in agriculture.

Learning Outcomes in EP (LOP):

LO 4 - Apply the principles of distribution, systematization, evolution and phylogenetic relationships of plants, animals and microorganisms in the environment in the learning process;

LO 5 - Distinguishes knowledge gained in the learning process, including structural, functional features of the development of living organisms

LO 6 - Determines the goals and principles of the study, is able to make scientifically based decisions based on the results of biological experiments, clearly formulates the conclusions of the results;

Learning Outcomes in Course (LOC):

LOC 1 – Effectively uses the acquired knowledge for further study of biological disciplines

LOC 2 –Can identify the main groups of insects

LOC 3 –Works with visual AIDS, animals in natural and fixed fluids, models, tables, diagrams, laboratory equipment, microscopic equipment

LOC 4 –Uses innovative technologies

Post requisites: Zoology of Vertebrates

Optional component 2

Course: Systematic of Plants

Intensity of the Course: 6 academic credits

Module Code: BPA 203/1

Module Name: Biodiversity of plants and animals

Prerequisites: Plant anatomy and morphology

Purpose: To study the diversity of plant organisms and their classification

Short Description: Students know the full morphological characteristics of higher and lower plants, taking into account the structural specifics of various plant families. Based on the analysis of the anatomical and morphological features of plants, their taxonomic state can be determined. Distinguish plants by families, genera, species in accordance with international nomenclature. Conducts biological excursions with students to various biotopes in nature. Possesses the skills of herbarization of plants and research work

Learning Outcomes in EP (LOP):

LO 4 - Apply the principles of distribution, systematization, evolution and phylogenetic relationships of plants, animals and microorganisms in the environment in the learning process;

LO 5 - Distinguishes knowledge gained in the learning process, including structural, functional features of the development of living organisms

LO 6 - Determines the goals and principles of the study, is able to make scientifically based decisions based on the results of biological experiments, clearly formulates the conclusions of the results;

Learning Outcomes in Course (LOC):

LOC 1-recognizes the main plant families;

LOC 2-familiar with plant classification procedures;

LOC 3-familiar with the basic principles and rules of plant nomenclature;

LOC 4-evaluates the role of taxonomy in the biological sciences and knows the basic terminology used to describe plants;

LOC 5-uses innovative technologies

Post requisites: Biochemistry, Plant Physiology

Optional component 2

Course: Evolution of Plants and Animals Life

Intensity of the Course: 6 academic credits

Module Code: BPA 203/2

Module Name: Biodiversity of plants and animals

Prerequisites: Plant anatomy and morphology

Purpose: The main goal of the course is to understand the causes and general laws of the historical development of living matter.

Short Description: In the course of studying the discipline, students study the evolution of flora and fauna, the first stages of life on Earth, the development of living beings, the systematic features of the formation of species. On the basis of a comparative analysis of the differences between plants and animals, the complexity of the stages of development from the simplest to higher organisms is shown.

Learning Outcomes in EP (LOP):

LO 4 - Apply the principles of distribution, systematization, evolution and phylogenetic relationships of plants, animals and microorganisms in the environment in the learning process;

LO 5 - Distinguishes knowledge gained in the learning process, including structural, functional features of the development of living organisms

LO 6 - Determines the goals and principles of the study, is able to make scientifically based decisions based on the results of biological experiments, clearly formulates the conclusions of the results;

Learning Outcomes in Course (LOC):

LOC 1 - be able to acquire new knowledge using modern information and educational technologies;

LOC 2 -possess the skills and methods of research of biological objects (preparing an object for research, sketching, working with herbarium and collection material, etc.);

LOC 3 -have an idea of the methods of analysis and modeling of evolutionary processes;

LOC 4 -to understand the role of the evolutionary idea in the biological worldview,

LOC 5 -know the basic theories of evolution and the concept of specification

Post requisites: Biochemistry, Plant Physiology

Optional component 3

Course: Zoology of Vertebrates

Intensity of the Course: 6 academic credits

Module Code: BPA 204/1

Module Name: Biodiversity of plants and animals

Prerequisites: Zoology of Invertebrates

Purpose: Study of anatomical and morphological, evolutionary, ecological and ethological features of chordal animals. Determining their place in the hierarchy of living organisms. The study of the systematics and distribution of vertebrates.

Short Description: Zoology is a fundamental science that generalizes the molecular-genetic, physiological, morphological and behavioral directions of animal research within the framework of ecological and evolutionary approaches. From this point of view, the course of vertebrate zoology can be considered as a basic or fundamental for understanding the structure and life of representatives of vertebrates, including humans.

Learning Outcomes in EP (LOP):

LO 4 - Apply the principles of distribution, systematization, evolution and phylogenetic relationships of plants, animals and microorganisms in the environment in the learning process;

LO 5 - Distinguishes knowledge gained in the learning process, including structural, functional features of the development of living organisms

LO 6 - Determines the goals and principles of the study, is able to make scientifically based decisions based on the results of biological experiments, clearly formulates the conclusions of the results;

Learning Outcomes in Course (LOC):

LOC 1-Systematizes the modern system of vertebrates

LOC 2-knows the main and main sections of vertebrate zoology;

LOC 3 - can define the main g

roups of vertebrates

LOC 4-works with visual aids, animals in natural and fixing liquids, models, tables, diagrams, laboratory equipment, microscopic equipment

LOC 5-uses innovative technologies

Post requisites: Human and Animal Physiology, Biochemistry

Optional component 3

Course: Teriology

Intensity of the Course: 6 academic credits

Module Code: BPA 204/2

Module Name: Biodiversity of plants and animals

Prerequisites: Zoology of Invertebrates

Purpose: acquisition of theoretical knowledge and practical skills in biology and ecology of commercial mammals by future hunting biologists

Short Description: When mastering the course of theriology, students study the systematization, characteristics, history of origin, the specifics of the structure, ways of adapting to life on earth, evolution, diversity and significance of mammals. Since mammals are the most developed class among animals in terms of adaptation and evolution, they are the key to understanding the features of development and interaction of all living beings with the environment.

Learning Outcomes in EP (LOP):

LO 4 - Apply the principles of distribution, systematization, evolution and phylogenetic relationships of plants, animals and microorganisms in the environment in the learning process;

LO 5 - Distinguishes knowledge gained in the learning process, including structural, functional features of the development of living organisms

LO 6 - Determines the goals and principles of the study, is able to make scientifically based decisions based on the results of biological experiments, clearly formulates the conclusions of the results;

Learning Outcomes in Course (LOC):

LOC 1-determines the species belonging of mammals by traditional and electronic determinants;

LOC 2-acquires a number of practical skills in conducting research to determine the dynamics of animals, to preserve and multiply the number of animals;

LOC 3-has the skills of discussion and argumentation when discussing issues on the discipline

LOC 4-knows the features of morphology, physiology and features of reproduction, geographical distribution and ecology of commercial mammals;

LOC 5-is able to use the obtained data to solve industrial, scientific and practical problems, plans measures for the protection of commercial and hunting animals, their protection and rational use of animals.

Post requisites: Human and Animal Physiology, Biochemistry

Optional component 4

Course: Biochemistry

Intensity of the Course:5 academic credits

Module Code: SBB 303/1

Module Name: Selected Branches of Biology

Prerequisites: Cytology, Histology and Embryology

Purpose: Assimilation of the chemical composition of living organisms, their metabolism and its role in life processes, biochemical processes in the growth and development of plants and the formation of professional skills of students.

Short Description: The course describes the classification and physico-chemical properties of amino acids that make up proteins. Knows the chemical composition and mechanism of action of enzymes and catalyzed reactions. The general patterns

of metabolism and the role of vitamins and hormones in it are considered. Studies the digestion and absorption of carbohydrates and lipids in a living organism, as well as the spatial structure and process of protein biosynthesis.

Learning Outcomes in EP (LOP):

LO 6 - Determines the goals and principles of the study, is able to make scientifically based decisions based on the results of biological experiments, clearly formulates the conclusions of the results;

LO 7 - Carries out a comparative analysis of experimental data obtained in laboratory conditions, independently makes decisions, critically evaluates the necessary information.

LO 10 - Possesses knowledge in the field of modern biological science, studies, generalizes, applies and disseminates the experience of highly professional teachers

Learning Outcomes in Course (LOC):

LOC 1-Masters the methods of studying proteins, carbohydrates, lipids, enzymes and other compounds.

LOC 2-Explains the advantages and disadvantages by comparing photosynthesis, respiratory tract, types of minerals, phytohormones, stages of growth and development.

LOC 3-Proves the laws of the vital activity of living organisms and the relationship between biological processes.

LOC 4-Can use equipment used in biochemical research.

LOC 5-Professionally uses the materials of the course on the subject of "Biochemistry" when performing individual thematic and project research

Post requisites: Human and Animal Physiology, Genetics and Fundamentals of Molecular Biology

Optional component 4

Course: Basics of Enzymology

Intensity of the Course: 5 academic credits

Module Code: **SBB 303/2**

Module Name: **Selected Branches of Biology**

Prerequisites: Cytology, Histology and Embryology

Purpose: The objectives of mastering the discipline "Enzymology" is to acquaint students with the basics of modern concepts in the field of the structure and function of proteins, to give the basic concepts of enzymatic catalysis, to consider the participation of enzymes in the basic biological processes of the cell.

Short Description: In the Basics of Enzymology course, students learn about enzymes (functional proteins). They study the principles of operation of protein molecules that catalyze or inhibit biochemical reactions that underlie all biological processes and are used in various industries, agriculture and medicine

Learning Outcomes in EP (LOP):

LO 6 - Determines the goals and principles of the study, is able to make scientifically based decisions based on the results of biological experiments, clearly formulates the conclusions of the results;

LO 7 - Carries out a comparative analysis of experimental data obtained in laboratory conditions, independently makes decisions, critically evaluates the necessary information.

LO 10 - Possesses knowledge in the field of modern biological science, studies, generalizes, applies and disseminates the experience of highly professional teachers

Learning Outcomes in Course (LOC):

LOC 1 – Master the system of knowledge about the strategy of structural and functional research of proteins and enzymes;

LOC 2-Has an idea of the laws underlying enzymatic catalysis in biological systems;

LOC 3-Owns methods for determining the activity of proteins and enzymes, bioregulators;

LOC 4-Analyzes the main mechanisms of the active centers of enzymes

LOC 5-Interprets the system of knowledge that characterizes modern methods of enzymatic research

Post requisites: Human and Animal Physiology, Genetics and Fundamentals of Molecular Biology

Optional component 5

Course: Human and Animal Physiology

Intensity of the Course: 7 academic credits

Module Code: **BPh 302/1**

Module Name: Basics of Physiology

Prerequisites: Human anatomy

Purpose: to Study the regularities of the processes of human and animal life at various structural levels (metabolism, respiration, nutrition, etc.), vital activity, activity of individual cells, organs, systems, to introduce their features.

Short Description: The aim of the course is the formation of theoretical knowledge about the general patterns and mechanisms of physiological processes in the body. In the course of mastering the course, students describe the regulation of the physiological processes of the body's vital activity, adaptation to changes in the external and internal environment, the relationship of the physiological processes of the body occurring in the human and animal body, use modern methods of studying physiological processes, evaluate the functional reserves of the body and characterize the manifestations of the vital functions of the body.

Learning Outcomes in EP (LOP):

LO 5 - Distinguishes knowledge gained in the learning process, including structural, functional features of the development of living organisms

LO 6 - Determines the goals and principles of the study, is able to make scientifically based decisions based on the results of biological experiments, clearly formulates the conclusions of the results;

LO 7 - Carries out a comparative analysis of experimental data obtained in laboratory conditions, independently makes decisions, critically evaluates the necessary information.

Learning Outcomes in Course (LOC):

LOC 1-Knowledge of the basic terms of human and animal physiology and the development of physiological research methods.

LOC 2-Knowledge of the functions of organs and organ systems of the human body, morphological features of the internal organs of a person.

LOC 3 – Be able to theoretically explain the principles of modern physiological methods and apply them in research.

LOC 4-scientific implementation of measures for effective change of processes in the human and animal body, prevention and proper treatment of various diseases

LOC 5 – be able to describe the main organs and systems of the body, their meaning and create didactic materials in the form of reference diagrams.

Post requisites: Ecological education, Evolutionary Doctrine

Optional component 5

Course: Age Endocrinology

Intensity of the Course: 7 academic credits

Module Code: **BPh 302/2**

Module Name: Basics of Physiology

Prerequisites: Human anatomy

Purpose: The purpose of mastering the discipline of age-related endocrinology is to form a student's in-depth professional knowledge and skills in the specialty of endocrinology.

Short Description: The purpose of this discipline is the formation of systemic knowledge of endocrinological diseases, the formation of skills in the diagnosis, treatment and management of patients with endocrinological diseases. Students study the clinic, diagnose endocrinological diseases, study the procedure and conditions for providing assistance in emergency endocrinological conditions.

Learning Outcomes in EP (LOP):

LO 5 - Distinguishes knowledge gained in the learning process, including structural, functional features of the development of living organisms

LO 6 - Determines the goals and principles of the study, is able to make scientifically based decisions based on the results of biological experiments, clearly formulates the conclusions of the results;

LO 7 - Carries out a comparative analysis of experimental data obtained in laboratory conditions, independently makes decisions, critically evaluates the necessary information.

Learning Outcomes in Course (LOC):

LOC 1-To know the structure and functions of the endocrine glands;

LOC 2-General and functional research methods in endocrinology;

LOC 3-To know the general patterns of growth and development of children and adolescents.

LOC 4-Acquaintance with the protection, strengthening and training of the health of children and adolescents.

LOC 5-The use of physiological methods for diagnosing health.

Post requisites: Ecological education, Evolutionary Doctrine

Optional component 6

Course: Plant Physiology

Intensity of the Course: 6 academic credits

Module Code: **BPh 301/1**

Module Name: Basics of Physiology

Prerequisites: Plant anatomy and morphology, Biochemistry

Purpose: The main goal of teaching plant physiology is to give students a modern understanding of the basic physiological processes of a green plant, the mechanisms of their regulation and the laws governing the interaction of plants with environmental conditions.

Short Description: In the course of studying the course, students study the general patterns of vital activity of plant organisms, the processes of absorption of minerals and water by plant organisms, the processes of growth and development, flowering and fruiting, nutrition through roots (mineral) and air (photosynthesis), respiration, biosynthesis and accumulation of various substances. The purpose of the course is to give students a modern understanding of the basic physiological processes of plants, the mechanisms of their regulation and the patterns of interaction of plants with environmental conditions

Learning Outcomes in EP (LOP):

LO 6 - Determines the goals and principles of the study, is able to make scientifically based decisions based on the results of biological experiments, clearly formulates the conclusions of the results;

LO 7 - Carries out a comparative analysis of experimental data obtained in laboratory conditions, independently makes decisions, critically evaluates the necessary information.

LO 10 - Possesses knowledge in the field of modern biological science, studies, generalizes, applies and disseminates the experience of highly professional teachers

Learning Outcomes in Course (LOC):

LOC 1- he knows the basic physiological methods of assessing the state of living systems

LOC 2-has experience in the observation, description, classification, breeding of biological objects

LOC 3-Is able to present and critically analyze basic general professional information.

LOC 4-Is able to apply experimental methods when working with plants in the field and laboratory conditions

LOC 5-Has the skills to work with modern equipment when conducting physiological studies.

Post requisites: Ecological education, Evolutionary Doctrine

Optional component 6

Course: Physiology of Plant Resistance to Adverse Environmental Conditions

Intensity of the Course: 6 academic credits

Module Code: **BPh 301/2**

Module Name: Basics of Physiology

Prerequisites: Plant anatomy and morphology, Biochemistry

Purpose: studying the ecology of pathogens of infectious diseases in the environment.

Short Description: In the course of studying the discipline, students study the impact of adverse conditions on plants. As a result, students observe various stressful situations arising on plants. Examines the processes of adaptation of plants to stresses caused by the slow development of adverse conditions. They understand that the changed conditions are reversible physiological processes.

Learning Outcomes in EP (LOP):

LO 6 - Determines the goals and principles of the study, is able to make scientifically based decisions based on the results of biological experiments, clearly formulates the conclusions of the results;

LO 7 - Carries out a comparative analysis of experimental data obtained in laboratory conditions, independently makes decisions, critically evaluates the necessary information.

LO 10 - Possesses knowledge in the field of modern biological science, studies, generalizes, applies and disseminates the experience of highly professional teachers

Learning Outcomes in Course (LOC):

LOC 1-knows the principles of monitoring, assessment of the state of the natural environment and wildlife protection, participates in the planning and implementation of relevant activities

LOC 2-demonstrates knowledge of the principles of structural and functional organization of biological objects and mechanisms of homeostatic regulation

LOC 3-applies the basic physiological methods of analysis and assessment of the state of living systems

LOC 4-applies the basic concepts of the principles of rational nature management and nature protection.

LOC 5-uses the basics of general, systemic and applied ecology

Post requisites: Ecological education, Evolutionary Doctrine

Optional component 7

Course: Ecological education

Intensity of the Course: 4 academic credits

Module Code: **SBB 405/1**

Module Name: Selected branches of biology

Prerequisites: Plant anatomy and morphology, Zoology of Invertebrates

Purpose: environmental education to preserve the sustainability of the environment.

Short Description: The course examines the patterns of formation and ways to solve environmental problems arising under the influence of the relationship between man, society and nature. Students critically assess environmental issues through analysis, differentiation. Studies effective methods of environmental education. Helps to form the skills necessary for environmental education in accordance with the topics of school textbooks.

Learning Outcomes in EP (LOP):

LO 6 - Determines the goals and principles of the study, is able to make scientifically based decisions based on the results of biological experiments, clearly formulates the conclusions of the results;

LO 7 - Carries out a comparative analysis of experimental data obtained in laboratory conditions, independently makes decisions, critically evaluates the necessary information.

LO 11 - Has a high motivation for teaching, strives for self-education and self-knowledge.

Learning Outcomes in Course (LOC):

LOC 1-mastering new knowledge using modern information and educational technologies;
LOC 2-knowledge of skills and methods of studying environmental objects;
LOC3-have an understanding of the methods of analysis and modeling of environmental processes;
LOC 4-understanding the role of natural objects in the environment;
LOC 5-knowledge of modern approaches to environmental education
Post requisites: Fundamentals of Educational research

Optional component 7

Course: Teaching about the environment

Intensity of the Course: 4 academic credits

Module Code: **SBB 405/2**

Module Name: Selected branches of biology

Prerequisites: Plant anatomy and morphology, Zoology of Invertebrates

Purpose: to understand the causes and general laws of the historical development of the place of existence of living matter.

Short Description: On the course, students study environmental risk factors that harm the environment, exposure to mutagens and carcinogens, heavy metal pollution, pesticides, understands the mechanisms of carcinogenesis. He also knows how to protect the environment and efficiently use natural resources.

Learning Outcomes in EP (LOP):

LO 6 - Determines the goals and principles of the study, is able to make scientifically based decisions based on the results of biological experiments, clearly formulates the conclusions of the results;

LO 7 - Carries out a comparative analysis of experimental data obtained in laboratory conditions, independently makes decisions, critically evaluates the necessary information.

LO 11 - Has a high motivation for teaching, strives for self-education and self-knowledge
Learning Outcomes in Course (LOC):

LOC 1-mastering knowledge about the environment using modern information and educational technologies;
LOC 2-knowledge of skills and methods of studying places and objects of living matter habitat;
LOC 3-is capable of critical analysis of modern scientific research and practical evaluation of new ideas when solving research projects, including in interdisciplinary fields;
LOC 4-comparison of the problems of the global social environment;
LOC 5-the ability to analyze the safety of life.
Post requisites: Fundamentals of Educational research

2. OPTIONAL COMPONENTS OF THE CYCLE OF MAJOR COURSES

Optional component 1

Course: Human anatomy

Intensity of the Course: 5 academic credits

Module Code: SBB 301/1

Module Name: Selected branches of biology

Prerequisites: Zoology of Vertebrates

Purpose: deep assimilation by students of the structure of the human body, organ system and individual organs based on modern achievements of anatomy, physiology and biology; the ability to use the acquired knowledge in the study of other fundamental disciplines, as well as in future research and production activities.

Short Description: When mastering the course "Human Anatomy", students study the shape and structure, origin and development of the human body. Anatomy provides a systematic description of the shape, structure, position and topographic relationships of parts and organs of the body, taking into account age, sex and individual characteristics..

Learning Outcomes in EP (LOP):

LO 5 - Distinguishes knowledge gained in the learning process, including structural, functional features of the development of living organisms

LO 9 - Analyzes the basic structure of the human body, historical development, age characteristics and its interaction with the environment

LO 11 - Has a high motivation for teaching, strives for self-education and self-knowledge.

Learning Outcomes in Course (LOC):

LOC 1 – Knowledge of basic terms of human anatomy and development of anatomical research methods.
LOC 2 – Knowledge of the anatomical structure and function of organs and systems of the human body, patterns of mental and physical development and features of their manifestation in different age periods.
LOC 3 – Mastering the methods of medical-biological, pedagogical and psychological control over the condition of students.

LOC 4 – Improvement of medical and biological, sanitary and hygienic, psychological and pedagogical bases of physical activity.

LOC 5 – Planning of various forms of classes taking into account climatic, regional, and national characteristics in order to protect the health, recovery, rehabilitation, and recreation of students; determining the functional state, level of physical development, and fitness of students at various stages of age development.

Post requisites: Genetics and Fundamentals of Molecular Biology, Human and animal physiology

Optional component 1

Course: Biology of individual development

Intensity of the Course: 5 academic credits

Module Code: **SBB 301/2**

Module Name: Selected branches of biology

Prerequisites: Zoology of Vertebrates

Purpose: to acquaint students with the laws of reproduction and individual development of organisms, as the fundamental basis of life processes.

Short Description: When mastering the course, students study the patterns of ontogenetic development of organisms. The course gives an idea of the macro- and micro-morphological, physiological-biochemical, molecular and genetic processes occurring in developing organisms, as well as the factors and mechanisms that control development processes at all stages of the ontogenesis of animal and plant organisms.

Learning Outcomes in EP (LOP):

LO 5 - Distinguishes knowledge gained in the learning process, including structural, functional features of the development of living organisms

LO 9 - Analyzes the basic structure of the human body, historical development, age characteristics and its interaction with the environment

LO 11 - Has a high motivation for teaching, strives for self-education and self-knowledge.

Learning Outcomes in Course (LOC):

LOC 1-They know the basic laws of individual development of animals and plants at all stages of ontogenesis in close connection with their historical development

LOC 2-They are able to understand about macro-and micromorphological, physiological and biochemical, molecular and genetic processes occurring in developing organisms

LOC 3-Possess basic knowledge in the field of developmental biology, understand the social significance of this knowledge, be able to predict the consequences of their professional activities

LOC 4 - Use in practice the acquired knowledge about the mechanisms of morphophysiological differentiation of the organism in ontogenesis; use the acquired knowledge to solve scientific and practical problems.

LOC 5-Has basic ideas about the laws of reproduction and individual development of biological objects

Post requisites: Genetics and Fundamentals of Molecular Biology, Human and animal physiology

Optional component 2

Course: Evolutionary Doctrine

Intensity of the Course: 5 academic credits

Module Code: **SBB 404/1**

Module Name: Selected branches of biology

Prerequisites: Genetics and Fundamentals of Molecular Biology

Purpose: to know the main methodological methods of studying the evolutionary process, the laws of the historical development of organic nature, the stages of evolutionary development

Short Description: The course is aimed at studying: the history of the formation of modern evolutionary theory and its main provisions; features of the processes of micro- and macroevolution; speciation concepts; the genetic structure of populations; causes of modification and mutational variability; consequences of the influence of abiotic, biotic and anthropogenic factors on the heredity and variability of living organisms.

Learning Outcomes in EP (LOP):

LO 6 - Determines the goals and principles of the study, is able to make scientifically based decisions based on the results of biological experiments, clearly formulates the conclusions of the results;

LO 7 - Carries out a comparative analysis of experimental data obtained in laboratory conditions, independently makes decisions, critically evaluates the necessary information.

LO 10 - Possesses knowledge in the field of modern biological science, studies, generalizes, applies and disseminates the experience of highly professional teachers

Learning Outcomes in Course (LOC):

LOC 1- Students use the knowledge of evolutionary theory to form worldview views.

LOC 2- Students ' mastering of the theory of evolution develops their ability to independently analyze and synthesize complex materials of modern biology.

LOC 3- knows about organic evolution, the genetic and ecological foundations of evolution, the driving forces and results, the main stages of life development

LOC 4- analyzes the evolutionary processes

LOC 5- understands the main signs and stages of the evolution of life on Earth

Post requisites: Fundamentals of Educational research

Optional component 2

Course: Anthropology

Intensity of the Course: 5 academic credits

Module Code: **SBB 404/2**

Module Name: Selected branches of biology

Prerequisites: Genetics and Fundamentals of Molecular Biology

Purpose: to indicate the presence of morphological, physiological and genetic associations in the development of Homo sapiens

Short Description: This course studies the origin and evolution of humans and human races, the physical structure of humans, and the morphological and physiological features of people's ethnic and other communities. Students studies the formation of human culture and civilizations, the structure of human society in different historical periods and in different territories.

Learning Outcomes in EP (LOP):

LO 6 - Determines the goals and principles of the study, is able to make scientifically based decisions based on the results of biological experiments, clearly formulates the conclusions of the results;

LO 7 - Carries out a comparative analysis of experimental data obtained in laboratory conditions, independently makes decisions, critically evaluates the necessary information.

LO 10 - Possesses knowledge in the field of modern biological science, studies, generalizes, applies and disseminates the experience of highly professional teachers

Learning Outcomes in Course (LOC):

LOC 1 – Knows historical materials and methods

LOC 2 – analyzes the main theories of human origin

LOC 3 – is able to explain the content of the questions raised in a reasoned and complete manner;

LOC 4 – can participate in the discussion, giving a reasoned opinion;

LOC 5 – knows the basic terms and concepts of anthropology

Post requisites: Fundamentals of Educational research

Optional component 3

Course: Age physiology

Intensity of the Course: 6 academic credits

Module Code: **BPh 203/1**

Module Name: Basics of Physiology

Prerequisites: Zoology of Vertebrates

Purpose: Study of the functions, structural features of organs and organ systems of the human body in different age periods

Short Description: In the course, students study the functions of organs and systems of organs of the human body at different age stages, the dynamics and mechanisms of the development of the psyche and the features of new structures of the psyche. The knowledge gained by the student in the course of mastering the course makes it possible to expand the scientific horizons of future specialists, to form theoretical and practical knowledge of readiness for pedagogical activity

Learning Outcomes in EP (LOP):

LO 7 - Carries out a comparative analysis of experimental data obtained in laboratory conditions, independently makes decisions, critically evaluates the necessary information.

LO 9 - Analyzes the basic structure of the human body, historical development, age characteristics and its interaction with the environment

LO 11 - Has a high motivation for teaching, strives for self-education and self-knowledge.

Learning Outcomes in Course (LOC):

LOC 1 – Knows the physiological characteristics of the main processes of the human body;

LOC 2 – Knows the patterns of ontogenetic development

LOC 3 – Knows favorable and unfavorable environmental factors affecting the physical and mental development of children

LOC 4 – He is able to give a physiological justification to the basic hygienic rules and norms

LOC 5 – Possesses methods of determining the main external indicators of the activity of physiological systems (cardiovascular, respiratory, visual, etc.)

Post requisites: Human anatomy, Human and animal physiology

Optional component 3

Course: Age morphology

Intensity of the Course: 6 academic credits

Module Code: BPh 203/2

Module Name: Basics of Physiology

Prerequisites: Zoology of Vertebrates

Purpose: Formation of students' understanding of the basic laws of the structure of the human body

Short Description: In the course of studying this subject, students will study the features of structural changes in the body in the process of individual development (ontogenesis) and the science of the laws of body formation. The content of the course of age morphology is the study of anthroposcopic and anthropometric methods that allow to assess the harmony of the development of children and adolescents, determine the type of body constitution, study environmental factors, including special loads and effects, and have a harmful effect on a person

Learning Outcomes in EP (LOP):

LO 7 - Carries out a comparative analysis of experimental data obtained in laboratory conditions, independently makes decisions, critically evaluates the necessary information.

LO 9 - Analyzes the basic structure of the human body, historical development, age characteristics and its interaction with the environment

LO 11 - Has a high motivation for teaching, strives for self-education and self-knowledge.

Learning Outcomes in Course (LOC):

LOC 1 – *Knows anatomical and physiological features of individual systems and the organism as a whole in different periods of ontogenesis*

LOC 2 – He is able to teach students the skills of preserving and strengthening health

LOC 3 – Owns the methodology of anthropometric research on the assessment of physical development and body type;

LOC 4 – Able to evaluate individual physiological characteristics of children and adolescents

LOC 5 – Possesses psychological and pedagogical, medical and biological, organizational and managerial knowledge and skills.

Post requisites: Human anatomy, Human and animal physiology