

Ministry of Science and Education of the Republic
of Azerbaijan

Gəncə Dövlət Universiteti



UNDERGRADUATE LEVEL

**SUBJECTS INCLUDED IN THE CURRICULUM
DEVELOPED ON THE BASIS OF THE EDUCATION
PROGRAM FOR THE CHEMISTRY AND BIOLOGY
TEACHER (050110) SPECIALIZATION (051010 MSERA.**

F381.13.08.2020)

**LEARNING OUTCOMES BY CURRICULUM AND
SUBJECTS**

**Azerbaijan Republic
Ministry of science and education
GANJA STATE UNIVERSITY**

LEARNING OUTCOMES FOR SUBJECTS

**Faculty of chemistry and biology
28.01.2022 of the Scientific Council
discussion at the (Pr.6) meeting
has been accepted.**

GANJA - 2022

INTRODUCTION

The learning results of the subject are evaluated as the main indicator of the student-oriented higher education system. Learning outcomes provide a basis for students to learn program materials in the educational process and to have skills such as synthesizing and evaluating what they should know, understand, and demonstrate as a specialist at the end of the course.

For the innovative development of chemistry and biology, it is necessary to obtain information about the latest scientific achievements and future development prospects and to have modern information technologies.

Staff training in the specialty of chemistry and biology teaching is to conduct research on the materiality and laws of living nature, biological processes, the composition and structure of organic and inorganic substances, the genetic relationship between chemical reactions, the fields of application of chemical substances, their properties, hydrolysis, electrolysis, oxidation-reduction reactions, and so on. It is required to show ways of solving related issues.

Pedagogical internship in chemistry and biology teaching profession is important in practical application of student's theoretical knowledge, as well as development of professional skills.

The educational program is mandatory for all higher education institutions operating in the Republic of Azerbaijan, regardless of their subordination, type of ownership, organizational-legal form, and carrying out bachelor's training in the specialty -050110- "Chemistry and Biology Teaching".

According to the framework document of the educational program of the Bachelor's level (basic (basic) sub-medical education) by specialty, approved by order No. F226 dated 13.08.2020 and a matrix that supports their achievement is drawn up and added to the learning outcomes.

**050110- LEARNING OUTCOMES
ON THE EDUCATION PROGRAM AND SUBJECTS OF
THE “CHEMISTRY - BIOLOGY TEACHER”
SPECIALIZATION
PROGRAM LEARNING OUTCOMES (PLO)**

PLO 1. He knows the history of Azerbaijan perfectly, demonstrates that he has systematically acquired clear, concise and comprehensible knowledge about the important events in the life of the Azerbaijani people, he has feelings of patriotism, nationalism, and love for his state, people and nation. that the state of Azerbaijan has the ability to protect its interests demonstrates.

PLO 2. Demonstrates high speech culture in the Azerbaijani language, applies stylistically correct, clear, precise speech and literary language norms with high professionalism. Demonstrates the ability and ability to speak freely in educational and scientific audiences, enter into dialogue, and make speeches.

PLO 3. Creates business and academic communication in foreign languages of the specialty, identifies additional information resources for solving problems, analyzes, summarizes and presents relevant information, processes and presents the results obtained from research conducted in field and laboratory conditions.

PLO 4. He studies the theoretical basis of pedagogy, theories of training, principles, methods, tools, organizational forms, modern training technologies, school management and the forms and methods of school management. The subject, methods of psychology, the age and psychological characteristics of students, the development of psychological methods for studying them, and their diagnostic research are studied . It focuses on modern methods and methods of using ICT tools : multimedia technologies operating on the basis of computing techniques, information input, collection,

processing, and transmission. It analyzes the essence of the multiculturalism policy of the Republic of Azerbaijan , socio-cultural processes, its characteristics and the reasons for the successful implementation of this policy in the country.

PLO 5. Scientific-theoretical bases of biology teaching methodology, biology subject curriculum and its characteristics, new pedagogical technologies, organization and management of teaching-learning process, teaching strategies determined in the direction of biology subject teaching, training planning, assessment of student achievements , the issues of organizing an effective teaching and learning environment are achieved in a theoretical **and practical way to become a bearer of values by forming skills in various directions.**

PLO 6. Analysis of the diversity of invertebrates and vertebrates, the characteristics of the local fauna, their structure and life activities, their distribution, their relationship with the living environment, their lifestyle, their ecological importance, their role in nature and human life, with the help of observation and experiment in the direction of investigating the regularities of individual and historical development. Special attention should be paid to inculcating the skills to conduct.

PLO 7. The morphological and anatomical structure of the plant organism, the structure and chemical composition of the cell, the structure and functions of intracellular structures, the development patterns of various systematic groups, taxonomic diversity and their evolutionary changes, the mechanism of occurrence and regulation of physiological processes, the interactions of living and non-living nature, Special attention should be paid to inculcating the ability to analyze the characteristics of environmental factors and general regularities with the help of observation and experiment.

PLO 8. C is a science that studies the chemical composition and properties of substances in living organisms ,

their transformations, as well as the chemical processes and metabolism that form the basis of the life activity of organisms . Biochemistry is usually divided into static, dynamic and functional biochemistry.

PLO 9. Development history of genetics, research methods, laws, material basis of heredity, chromosome theory, heredity and variation, genetics of ontogenesis, sex, population, genetic code and information, their storage, transfer and change, as well as modern scientific results. special attention should be paid to inculcating the skills to use knowledge in practical activities, to predict, to analyze with the help of mathematical calculations.

PLO 10. During the geological history, how life was formed from the inorganic world, the interaction of the **human** body by systems and the tissues and organs that make it up with each other and the external environment, the human and animal body cells, tissues, organs and special attention should be paid to instilling the skills to determine the function of systems, to use the acquired knowledge in practical activities.

PLO 11. General issues of teaching chemistry, principles of modern education, form, methods, tools and approaches of teaching inorganic and organic chemistry topics, possibilities of using new teaching technologies are studied in **general education schools**. Emphasis is placed on the energetics, flow rates, kinetics, dissolution processes, and oxidation-reduction reactions of chemical reactions. General characteristics, structures, methods of obtaining simple substances and their compounds, properties, fields of application and role in life of basic and additional subgroup elements are studied. The composition, structure and properties of organic substances and their compounds , thermocatalytic transformations of hydrocarbons are studied. Theoretical foundations of analytical chemistry, chemical composition of substances, determination of chemical structure and theoretical

foundations of physical chemistry, main objects of analysis, and methods of their analysis are studied.

PLO 12. The basic concepts of mathematics , elements of statistics and probability theory, their nature and areas of application are studied. Also, attention is paid to the application of the elements of higher mathematics to the solution of mathematical problems and the use of elements of mathematical statistics based on the analysis of the obtained results, as well as to the variable solutions of problems related to probability.

PLO 13. Physics is the science of nature and studies the various forms of matter, its properties and mutual transformation, the direction of processes, the mutual relations of electric and magnetic phenomena, the wave and corpuscular nature of light, the role of chemical bonds in the formation of physical properties, and the atomic and molecular structure of matter. In the study of all phenomena that occur in nature, the interaction of inanimate and living matter. The study of physics, which plays a leading role in the development of scientific and technical progress, gives students the opportunity to master other fundamental sciences, natural phenomena, and the main processes of various fields of science, technology and production.

PLO 14. Within the scope of this subject, prevention of emergencies, elimination of their consequences, weapons of mass destruction, nuclear weapons, application and consequences of nuclear weapons, damaging factors of nuclear weapons, radioactive pollution, methods of protection against biological weapons, quarantine measures, population protection during peace and war. The characteristics of protection, personal protective equipment, the rules for organizing and performing rescue work in accidents and natural disasters, the rules of behavior and action when chemical weapons are used, and the organization of sanitary

teams in the provision of first aid in various damage centers and natural disaster regions are studied.

PLO 15 . In this subject, special attention should be paid to inculcating the ability to analyze modern information about the nature, classification, morphology and ultrastructure, physiology, reproduction mechanisms, chemical composition, movement methods, the influence of external environmental factors, variability, genetics and ecology of microorganisms, and to connect theoretical knowledge with practical activities.

SUBJECT LEARNING OUTCOMES (SLO)

GS = B01 "History of Azerbaijan"

SLO 1. Acquires highly creative and critical thinking, patriotism, broad erudition, socio-political responsibility, written and oral speech habits, leadership ability, is able to use terms freely.

SLO 2. Is able to analyze the main stages of development of historical human society, the laws of their replacement; is able to analyze the objective factors that determine the occurrence of historical processes that lead to the replacement of civilizations.

SLO 3. Is able to use historical sources and documents in the investigation of historical events and problems; is able to compare numerous materials of different historical periods, differentiate and generalize them according to their similar and different characteristics during the study of a historical event and problem.

SLO 4. During the investigation of historical problems, he is able to avoid bias, one-sided coverage of events, critically analyze and describe the main essence of social processes on a scientific-objective level.

SLO 5. In the process of researching historical events, he is able to use numerous examples of pre-writing material culture, including archeology and numismatics .

SLO 6. It is able to independently study and develop the historical-geographic borders of the states that have existed in the territory of Azerbaijan from the earliest times until today, the meaning of their names, socio-economic and political aspects based on numerous and reliable sources.

SLO 7. Has the ability to use historical knowledge and skills in strengthening the basic principles of the statehood of the Republic of Azerbaijan.

SLO 8. He is able to benefit from his knowledge of the history of the Motherland in the processes of proof and non-proof in protecting and strengthening the national interests of the Republic of Azerbaijan.

SLO 9. Able to apply space-time factors to the most diverse periods, "restore"-reconstruct any historical event and process in the local time-space section, create a historical model.

SLO 10. It is able to use the achievements of historical science to protect the material and moral values and blood memory of Azerbaijan for future generations, to convey and promote our historical truths to the world community.

GS=B02 "Business and academic communication in the Azerbaijani language"

SLO 1. Formation of business and academic communication thanks to the state care given to the mother tongue in the conditions of modern globalization, knows the goals and objectives of the subject "Business and academic communication". Prepares decrees and orders on the state language, presentations on "Great leader Heydar Aliyev and the Azerbaijani language";

SLO 2. Distinguishes the concept of speech culture and cultural speech. He knows the role of the styles of speech culture and the norms of Azerbaijani literary language in communication. He learns to establish stable and free

normative principles of communicativeness in the Azerbaijani language at the level of modern requirements.

SLO 3. Master the system of styles of Azerbaijani literary language and issues of differentiation and integration in styles.

SLO 4. Adopts communication ethics. Uses written and verbal etiquette correctly. Listening and attention, forms of listening, improves listening skills.

SLO 5. Has theoretical and practical studies on business rhetoric.

SLO 6. Understands that body language, gestures, facial expressions and clothing requirements are the main means of communication.

SLO 7. Acquires the ability to present in Azerbaijani language. Information society and modern linguistics are fully informed about Azerbaijani language content on the Internet.

GS =B03 "Business and academic communication in a foreign language

SLO 1. Communicate using simple sentences in everyday life.

SLO 2. To communicate in various business situations.

SLO 3. To communicate orally in different contexts they may encounter in their daily and professional lives.

SLO 4. Knowing the characteristics of business and academic writing, preparing texts in different contexts.

SLO 5. Knowing the content and structure of academic and business speech, using it in communication.

SLO 6. To read and understand small paragraphs, dialogues and texts in English, to acquire written and oral expression skills in different contexts.

ESS=B00 GS =BS01 "Philosophy "

SLO 1. Philosophy knows the theoretical world view.

SLO 2. Philosophy knows the most general theoretical system of outlook on the world and the place of man in it, on the relationship of man to reality, and thinking to existence.

SLO 3. Philosophical worldview, regardless of whether it is idealistic or materialistic, always knows the attitude towards man and the world.

SLO 4. Studies the regularities of the formation of national ideology in Azerbaijan, which is advancing confidently on the path to independence.

SLO 5. Philosophy, being a theoretical worldview, is able to correctly convey to students the ideas about the relationship of humanity, existence to reality, and thinking to existence.

SLO 6. Regardless of whether the philosophical worldview is materialistic or idealistic, young people learn that it is always based on a person's attitude to the world.

GSBS-01 "2. Sociology"

SLO 1. Understands sociology and its importance, subjects and functions, knows society and its structure

SLO 2. Is able to compare the essence of social territorial associations and social structure

SLO 3. Compares social laws and social mobility, is able to analyze social-ethnic relations

SLO 4. Analyzes the activity of social institutions and organizations, is able to use the methods of social control

SLO 5. Able to present to an audience on comparative analysis of politics, administration, public opinion and sociology of law

SLO 6. Forms ideas about the science of sociology.

GSBS-01 "3. The Constitution of the Republic of Azerbaijan and the Fundamentals of Law"

SLO 1. concept of law, theories, its objects and subjects, norms and principles, sources, etc. is able to obtain concise but complete information and knowledge about

SLO 2. is able to assimilate information and knowledge about the concept of the state and theories about its origin, the classification of states and the constitution

SLO 3. Knows the concepts of human and citizen in law, the concept and classification of human rights, citizenship issues

SLO 4. Knows the nature of state power and management system, as well as local self-government and civil society in the Republic of Azerbaijan

SLO 5. Knows the norms and principles of property, civil law, civil contract, as well as legal concepts and concepts related to them, reflected in the relevant legislation;

SLO 6. Researching the legal-sociological foundations of the family concept, knows the study of the basic norms of family legislation

SLO 7. Mastering the skills of researching the modern labor market. Labor contract, labor rights, labor protection, etc. able to analyze and investigate fundamental legal issues.

SLO 8. Knows how to acquire information and knowledge about the concepts of crime and punishment, as well as the basic norms and principles of criminal legislation

SLO 9. Administrative violation, administrative liability, etc. is able to study the concepts in detail, as well as investigate the issues of administrative protection of rights

GSBS-01 4. Logic

SLO 1. As a result of teaching the subject, the student knows the regularities of thinking.

SLO 2. The study of these laws allows students to know the correct construction of ideas in the reasoning process.

SLO 3. Studying the science of logic with reference to regularities leads to their conscious use and analysis of reasoning.

SLO 4. Logic knows how to distinguish truth from falsehood by determining whether reasoning is correct or incorrect.

SLO 5. Learning the laws of thinking, being able to use them consciously in the reasoning process

SLO 6. By creating more consistent, non-contradictory, evidential thinking competence, he knows the rules of critical attitude towards both his own and other people's ideas.

GSBS-02 1. "Information Management"

SLO1. Information technologies and systems. Database management systems

SLO2. Access program. Working with tables in Access

SLO3 . Big data analytics. Big Data. Cloud technologies. Cloud services

SLO4 . Internet. Internet protocols. OSI model.

SLO5 . Introduction to HTML. Using colors on web pages, creating lists, hyperlinks, page tables using this language.

SLO6 . To acquire the habit of inserting CSS into an HTML document

GSBS-02 "2. Political Science"

SLO 1. Politics, democracy, political institutions, political processes, political power, political system, political regime, electoral system, freedom, etc. able to assimilate political concepts such as

SLO 2. knows the nature of international relations and political processes in Azerbaijan .

SLO 3. is able to distinguish between theoretical and applied knowledge and their role in making political decisions.

SLO 4. Knows the ability to conduct political research as well as use critical and comparative analysis.

SLO 5. is able to model and predict political processes.

SLO 6. is able to understand human and citizen rights and freedoms and use them in various spheres of public life.

SLO 7. the ability to listen, defend one's opinion and hold a discussion, and at the same time has the experience of solving various political problems independently.

SLO 8. is able to establish practical relations with others, realize individual and group interests through representative political institutions.

GSBS-02 "3. Fundamentals of Entrepreneurship and Introduction to Business"

SLO 1. Describes the business and entrepreneurship characterizing the market economy

SLO 2. Explains the socio-economic processes occurring in the market system from a theoretical and practical point of view

SLO 3. Entrepreneurship, which is the basic concepts of market economy, justifies the fact that the activities of business as an economic mechanism play an important role in the life of society and every person.

SLO 4. Develops the potentials of entrepreneurship and business development in Azerbaijan

SLO 5. Analyzes the possibilities of people with potential, subjects to join entrepreneurship and business

SLO 6. The possibilities of strategic development of entrepreneurship and business and their importance for the future period are justified.

GSBS-02 "4. Economy

SLO 1. Economics training provides students with basic economic concepts and theoretical tools such as control models. Students learn basic principles that have implications in the economic field.

SLO 2. Economics training provides opportunities for students to analyze their experiences, evaluate economic issues and develop analytical skills for various independent studies.

SLO 3. By participating in economics training, students develop the ability to evaluate and analyze different economic situations. It gives students the ability to make realistic decisions and conduct independent accounting.

SLO 4. Economics training helps students get acquainted with research methodology and techniques. It helps students develop the ability to organize independent research programs and investigate economic issues.

SLO 5. Economics training provides students with interesting experiences and events. This helps to create an opportunity to gain experience in various areas of the economy and develop practical skills of students.

SLO 6. Economics training provides extensive research and project work. It provides students with a number of opportunities to develop their ability to conduct independent research, develop research plans and solve economic problems.

SLO 7. Students conduct economic analyzes within the framework of training and develop the ability to present their independent opinions, advice and results as a result of research. Economics training equips students with general skills such as analytical thinking and problem solving skills and helps them to tackle economic issues in various fields.

SSB-01. "Pedagogy"

SLO 1. Modern state of education and development trends in the world and in Azerbaijan; The main concepts and categories of pedagogical science; the role and importance of national and cultural-historical factors in the educational process, the ratio of education, heredity and social environment; Basic laws, principles, forms, means and methods of pedagogical activity; Objective relationships of education, upbringing and development of personality in educational processes and society; Knowledge of the place and role of the history of education and pedagogy in the scientific-pedagogical system and the development of modern education

SLO 2. The main directions of development of the history of pedagogy, the main modern historical-pedagogical theories and concepts are able to:

SLO 3. To apply the forms and methods of pedagogical influence to professionally interact and increase the efficiency of joint activity; applies active learning methods to the pedagogical process;

SLO 4. Taking into account the pedagogical principles, he conducts various exercises and educational events; Conducts individual educational conversations;

SLO 5. Apply the acquired knowledge to conduct sociological research in the collective and use them to analyze the results of practical activity;

SLO 6. Able to develop test and rating systems, manage the training process, improve pedagogical skills; Able to apply individual approach in training;

SLO 7. Pedagogical purpose and using principles in pedagogical activity; Making decisions based on learning, intellectual labor culture, self-education and pedagogical knowledge; Forms and methods of monitoring modern educational technologies, ways of organizing teaching and cognitive activities, quality of education ; To acquire

elementary skills for analyzing the educational process, identifying and solving pedagogical problems

SLO 8. Basic information about the development of pedagogy from the earliest times to the present day, pedagogical terminology; To justify one's position on the basis of the use of pedagogical-historical materials as a researcher-teacher: In the successful implementation of training and professional activities, a unified view is formed of respecting the human personality.

SSB-02 "Psychology"

SLO 1 . To interpret the general essence of the science of psychology, the essence of mental processes, states and properties, the main stages of the history of psychology, the development of the science of psychology in Azerbaijan, research principles and methods, psyche and consciousness, the formation of consciousness, personality, activity, communication, group and collective.

SLO 2 . Mental processes: emotional cognition-emotions, perception, rational cognition-attention, memory, thinking, imagination, volitional-emotional processes-feelings and will, mental properties: let's define temperament, character, abilities.

SLO 3. To teach students the history of age psychology as an important field of psychology, its main divisions, its relationship with other sciences, the characteristics of ontogenetic development and the wide application of specific research methods.

SLO 4. To broadly analyze problems such as theories about the age periods of mental development, the essence of the concept of leading activity in mental development, the concept of a newborn child, the concept of new derivatives, the characteristics of mental development at different age stages.

SLO 5. To describe the reasons for the emergence of pedagogical psychology as a science, the history of

development, the psychology of age and the importance of the psychology of pedagogical activity.

SLO 6 . To describe the importance of the teacher being the main figure in the process of pedagogical activity , the teacher's pedagogical mastery, the role of knowledge acquired in the use of pedagogical abilities and skills in the educational process.

SSB-03 "ICT in Education"

SLO 1. To acquire the basic methods and means of information acquisition, storage and processing, to have the ability to use a computer as a means of information management and to have the ability to work with information in global computer networks.

SLO 2. To learn the concept of information, coding of information, number systems, measurement units of information and to acquire practical skills for making these calculations.

SLO 3. Technical support of the computer: to get acquainted with the devices of the computer, to learn their working principles.

SLO 4. Computer technical support: learning system programs, operating systems, service programs.

SLO 5. To acquire the ability to work in modern OS application and user programs.

SLO 6. Computer networks. Information search on the Internet. Information search systems.

SLO 7. Having the opportunity to use ICT tools to participate in training and self-training processes. Electronic teaching aids. Learning the rules of using electronic textbooks.

SLO 8. Mutual discussion of new proposals and comments on distance education.

SLO 9. Information security and information protection systems. Fight against viruses

SSB -04 "Introduction to multiculturalism

SLO 1. Knows the essence of multiculturalism, the reasons for its emergence, its importance as a unique component of culture ;

SLO 2. He knows the role of national leader H. Aliyev in the development of multiculturalism in Azerbaijan;

SLO 3. The world, including Azerbaijan, knows the ideas of tolerance, multiculturalism and theoretical-ideological foundations of multiculturalism formed in the history of social-philosophical thought;

SLO 4. Knows the importance of multiculturalism in regulating religious and ethnic-national diversity in society

SLO 5. Knows the progressive experience of world states in the regulation of ethnic-cultural diversity;

SLO 6. Able to interact with multiculturalism and socio-economic development, foreign policy

SLO 7. It is capable of regulating ethnic-cultural diversity in Western countries

SLO 8. knows the essence, characteristics, sources and advantages of the Azerbaijani and world model of multiculturalism;

SLO 9. He knows the specific work done by the Azerbaijan state and the Heydar Aliyev Foundation in the field of multiculturalism in modern times

SSB-05 Biology teaching methodology

SLO 1. History and methodology of biology teaching methodology is studied and summarized

SLO 2. The scientific-theoretical foundations of the school biology course are mastered

SLO 3. The main directions for improving the teaching of biology are defined

SLO 4. The classification of teaching methods of biological concepts is given;

SLO 5. Basic principles of biological laws and theories

are studied

SLO 6. Biodiversity protection and National monitoring are applied

SSB-06 Invertebrate Zoology.

SLO 1. It applies the methods of analysis based on the morphological and physiological structure of invertebrates, lifestyle, distribution in nature, ecological importance, comparative morphology of invertebrates and vertebrates.

SLO 2. Morphological features of the sub-world of protozoa and unicellular determine the classification.

SLO 3. Analyzes the morphological characteristics, lifestyle, distribution in nature of the type of spores.

SLO 4. Differentiates and classifies infusors according to their morphological characteristics and species diversity.

SLO 5. Analyzes the morphological characteristics and important representatives of the types of sponges and gastropods.

SLO 6. Classifies morphological features and important representatives of Platelmintes and Nematelmintes types.

SSB-07 Vertebrate zoology

SLO 1. Morphological structure of vertebrates, lifestyle, distribution in nature, ecological importance. The type of cephalopods determines the morphological characteristics and classification of the class of cephalopods.

SLO 2. It classifies the general morphological structure, lifestyle, distribution in nature of the subtype of surfichords or tunicates .

SLO 3. Morphological features of Vertebrates or Skulls subtype, species diversity. It classifies the morphology and important representatives of roundmouths.

SLO 4 . The class of fishes. Analyzes the morphological structure, classification and distribution of important representatives of cartilaginous fish in nature.

SLO 5. The structure, physiology, classification, lifestyle, distribution in nature and important representatives of bony fishes are analyzed.

SLO 6. Evaluates the morphological characteristics, physiology and classification of amphibians .

SSB-08 Plant anatomy and physiology

SLO 1. Working principles of plant morphology and anatomy are studied

SLO 2. The cell is studied as the basic structural unit of living organisms

SLO 3. Concept of plant tissue and classification of tissues is given

SLO 4. Able to learn structural laws of vegetative organs of plants

SLO 5. Vegetative, asexual and sexual types of reproduction are mastered in plants

SLO 6. Able to make presentations on flowers, groups of flowers, double fertilization, morphological analysis of flowering plants and the structure of fruits

SSB-09 . Systematics of plants

SLO 1. Able to analyze the goals and tasks of plant systematics, work methods.

SLO 2. General characteristics, distribution and classification of prokaryotes and eukaryotes are studied

SLO 3. He is able to study the formation of shibiyas, the struggle for existence, their importance in nature and human life, etc. at the level of modern requirements.

SLO 4. Master the main characteristics and classification of higher plants.

SLO 5. The classification of higher spore plants is given

SLO 6. Acquires skills about gymnosperms and angiosperms department.

SSB-10 Ecology

SLO 1. Forms the terminology and basic concepts of ecology, conceptual foundations, theoretical knowledge about the structure of ecological knowledge and solving ecological problems

SLO 2. Acquires a comprehensive ecological outlook based on the understanding of the importance of the organization of the living system at the level of the organism, the complexity of the interactions of living and non-living nature, and the place of man in ecological systems and the entire biosphere.

SLO 3. Main environmental factors, habitats and adaptation of organisms to them, interprets the main regularities of interactions with the environment

SLO 4. The structure and dynamics of the population, the types of population survival strategies, survival curves, the methods of estimating population size and density.

SLO 5. Explains the taxonomic composition and functional structure of biocenoses, types of biotic relationships in biocenoses.

SLO 6. The evolution of the biosphere, the preservation of the continuity of the biosphere, the laws of self-regulation and productivity of living systems.

SSB-12 Cytology

SLO 1. Knows the history of the development of cytology, modern ideas about the cell

SLO 2. Cell study methods are mastered

SLO 3. The structure and function of the cell are classified

SLO 4. Cytoplasm and its structural components are assimilated

SLO 5. Able to study the structural and functional components of the nucleus

SLO 6. A schematic representation of cell division is

summarized

SSB-13 Plant physiology

SLO 1. The goals and objectives of plant physiology are mastered

SLO 2. Physiology of the plant cell, Cell is the structural unit and molecular basis of living systems.

SLO 3. Photosynthesis and pigment systems are mastered

SLO 4. The history of plant respiration and development, respiration and oxidation-reduction processes are studied

SLO 5. The formation of the first life in the aquatic environment, the importance of the main properties of water in the life of plants, the free and combined forms of water, and the water balance of plants are studied.

SLO 6. Hormones that affect the growth and development of plants, the main phases of cell growth, growth characteristics, development, cycle of aging and rejuvenation, growth experiments are made, observations are made.

SSB-14 Biochemistry and molecular biology

SLO 1. Knows modern information about elementary organization of living things, chemical reactions occurring in organisms and science.

SLO 2. It studies the interdependence between macromolecules, their composition, structure and biological functions at the level of 3 main areas of biochemistry (static, dynamic and functional biochemistry).

SLO 3. Knows metabolic pathways (1,2,3) and their regulation in living organisms.

SLO 4. Knows the successive stages and importance of biosynthesis of biochemical substances at the cellular level.

SLO 5. Geneva etc. learns modern scientific information about engineering and its application areas.

SLO 6. Learns how to use measuring tools and equipment , is able to use them in biochemical research.

SSB-15 Genetics and selection

SLO 1. The study of the field of genetics of sex, a special branch of genetics, the study of linked inheritance, distinguishes X and Y chromosome-linked diseases and gives a detailed explanation about it. It explains the mechanism of crossing over and determines its role in linked inheritance.

SLO 2. Methods of studying human genetics, gives and analyzes the nomenclature of human chromosomes, the nomenclature of human hereditary diseases and multifactorial diseases.

SLO 3. Studying the genetics of microorganisms, explaining and analyzing the role and significance of experiments such as transformation and transduction in the development of genetics

SLO 4. Able to distinguish, explain and analyze variation and its forms, i.e. modification variation, which is non-heritable variation, and mutation, which is heritable variation, between different forms. Understands the causes, mechanisms, importance in selection and evolution.

SLO 5. Knows population genetics, the study of heredity in the population, the application of the Hardy-Weinberg law. Mathematical calculation of diseases prevalent in the population.

SLO 6. Knows the mechanism of creation, breeding and cloning of GMOs based on modern technologies of genetic engineering, knows the possibilities of application of heredity and variation laws in various fields of agricultural industry and medicine.

SSB-16 Evolutionary training

SLO 1 . It explains the purpose and task of the study of evolution as a science , systematizes the theories and ideas of evolution by tracing the history of its development since

antiquity. Analyzes the basic concepts of evolutionary science.

SLO 2. Acquires and analyzes the subject and learning methods of the subject of evolution education.

SLO 3. Determines on the basis of scientific evidence and facts how life arose from the inorganic world during the geological history, and how it passed the path of irreversible development from single-celled organisms to humans.

SLO 4. JB Lamarck and Ch. Analyzes the main essence and driving forces of Darwin's theory of evolution.

SLO 5. Analyzes and systematizes modern evolutionary theories and concepts.

SLO 6. The species, which is the elementary structural unit of evolution, explains its criteria and the event of elementary evolution.

SSB-17 Human anatomy

SLO 1. Learns and analyzes general information about the subject of human anatomy, bone and muscle system.

SLO 2. Internal members coordinate and analyze the bodies that make up the system.

SLO 3. Knows the determination of the structural principles of the blood-vessel and lymphatic system.

SLO 4. Understands the main essence of the nervous system based on knowledge of anatomical structures.

SLO 5. Knows the structural laws of endocrine glands.

SLO 6. Knows and analyzes the regularities of the anatomy of the sensory organs.

SSB-18 Human and animal physiology

SLO 1. Knows general physiological processes.

SLO 2. Able to organize, bring together, and coordinate working principles of organs and systems of organs.

SLO 3. Study of the blood system and determine blood groups in laboratory conditions.

SLO 4. Researches the physiology of the respiratory

system and the life capacity of the lungs.

SLO 5. Comparatively analyzes the function of digestive organs.

SLO 6. Able to analyze the function performed by the excretory system.

SSB-19. Didactics of chemistry

SLO 1. Explains the main concepts of didactics of chemistry, its development, problems related to other sciences, its purpose and polytechnic tasks as a subject of study in higher schools.

SLO 2. Analyzes the teaching, goal and system of chemistry according to didactic and psychological basis of teaching chemistry.

SLO 3. Describes didactic principles, general methodical principles, special methodical principles, modern teaching methods in the teaching of chemistry.

SLO 4. The chemical language as a specific tool in the teaching of chemistry reflects the development and application of the classification of concepts.

SLO 5. Acquires the ability to use modern teaching methods in the structure of the lesson.

SLO 6. The problematic approach to teaching chemistry, the role of motivation in problem-based learning, and ways of creation are described.

SLO 7. Training methods, training didactic principles, programmed training theory and computer programs are used

SSB-20 Teaching methodology of general chemistry

SLO 1. At the end of the course, students master the basic knowledge of chemistry and acquire the ability to apply that knowledge practically in life.

SLO 2. Adopts the educational, educational (scientific worldview education, patriotism education, ecological education, etc.) developmental functions of training. (for

example, mastering the functions of developing chemical concepts. For example, developing chemical concepts) and mastering the ability to use it in the learning process.

SLO 3. Chemistry learns the general principles of teaching, active learning methods (for example, problem-based learning, heuristic observation, etc.) and acquires the ability to use them effectively in the learning process.

SLO 4. In the training process, students master chemical laws and the requirements for independent work of students and acquire the ability to use that knowledge practically.

SLO 5. They master the organizational forms of training, form the lesson, types of work outside the classroom and the classroom, logical cognitive methods (inductive, detective and analogy) and acquire the ability to use them practically.

SLO 6. They master the new teaching technology, develop mental skills and form creative thinking, acquire the methods of creating interest in professions among students, the ability to test and evaluate knowledge.

SLO 7. They master the essence of the principle of interdisciplinary communication and acquire the ability to use it effectively in the learning process.

SSB-21 Methodology of teaching inorganic chemistry

SLO 1. At the end of the course, students master the necessary knowledge and skills related to inorganic chemistry (for example, the properties of the main classes of inorganic substances, oxides, bases, acids and salts), and are able to apply them to the learning process.

SLO 2. They master the educational, educational and developmental functions of training and acquire the ability to use them in the process of teaching inorganic chemistry.

SLO 3. They master active learning methods and acquire the ability to effectively use them in the inorganic chemistry

lesson.

SLO 4. They master the essence of the subject curriculum and acquire the ability to use it in the teaching process of inorganic chemistry.

SLO 5. They have the ability to acquire knowledge from various sources related to inorganic chemistry.

SLO 6. In the course of inorganic chemistry, they acquire the ability to form creative thoughts

SLO 7. They acquire the ability to use the principle of interdisciplinary communication in the teaching of inorganic chemistry.

SSB-22 General chemistry

SLO 1. Lists the history of the development of chemistry, information about the period of alchemy, its relationship with other sciences, fundamental laws and theories of chemistry, scientific discoveries.

SLO 2. Atom-molecule training acquires the ability to analyze ideas about atomic orbitals, quantum numbers, various models of the structure of the atom, regularity of arrangement of elements in the periodic system, and the periodic law .

SLO 3. Types of chemical connection; distinguishes between covalent, donor-acceptor, ionic and hydrogen bonds using the concept of electronegativity . He applies his theoretical knowledge about chemical bonding to different molecules . He can determine the valence ^{of an} atom using the Molecular Orbital Method .

SLO 4. Classification, structure and properties of complex compounds, dissociation of complex compounds and formation of complex cations and anions in laboratory conditions are demonstrated by experiments.

SLO 5. He can prepare solutions of different concentrations in the laboratory by summarizing the theories about solutions and the information about the types of solutions

according to their concentration.

SLO 6. By studying the theoretical information related to the kinetics of chemical reactions and thermochemistry, he can calculate the problems related to the thermal effect.

SLO 7. Explains corrosion, types, protection of metals from corrosion, thermodynamics of the corrosion process.

SLO 8. Can calculate the electronic balance of chemical reactions by determining the mechanism of the oxidation-reduction process, oxidizing and reducing agents.

SSB-23 Inorganic chemistry

SLO 1. Knows the general characteristics and structures of basic and additional semi-group elements, methods of obtaining simple substances and their combinations, properties, role in life and areas of application.

SLO 2. Comparatively analyzes the methods of obtaining chemical elements and compounds, their physical and chemical properties

SLO 3. It interprets the methods of obtaining the main and additional subgroup elements of the periodic system, the mechanism of some reactions depending on the conditions, and the fields of application in industry.

SLO 4. Able to model chemical processes by observing and experimenting with metals, non-metals and their compounds.

SLO 5. Analyzes the position of the main and additional semi-group elements in the periodic system, the acquisition of simple substances and compounds, and the regularities of the reactions related to their properties

SLO 6. He is able to strengthen his theoretical knowledge of the simple substances of the elements and their compounds by studying, solving problems and conducting chemical experiments.

SLO 7. He acquires the ability to solve theoretical and

experimental problems of chemistry of chemical elements and compounds .

SSB-24 Organic chemistry

SLO 1. Knows the history of organic chemistry development, its theoretical foundations, the possibility of controlling the reaction depending on the structure and properties of an organic substance, the conditions of its conduct, the synthesis of new substances, and the methods of purification and demonstrates them with research experiments.

SLO 2. Differentiates different classes of saturated and unsaturated organic compounds with open and closed structure, their physico-chemical properties, acquires scientific knowledge and skills by investigating their application areas.

SLO 3. Explains the isomerism, nomenclature, types of stress in the cycle, electron density occurring in the molecule, synthesis methods and chemical properties of hydrocarbons, acquires the ability to synthesize some of their representatives in the laboratory.

SLO 4. Systematizes and compares the reactivity of halogen-containing compounds, the mechanisms of mono- and bimolecular nucleophilic substitution reactions, and their application areas in organic synthesis and other fields.

SLO 5. Can predict the synthesis, properties and fields of application of compounds with new compounds, aromatic sulfo compounds based on compounds with metal-carbon bonds, acquires the skills to organize experiments.

SLO 6. It compares the synthesis of nitrogenous organic compounds, the dependence of their similar and different properties on their structure, the mechanism of transformation reactions, and predicts their application areas.

SLO 7. Based on the relationship between the physico-chemical properties and structure of different classes of oxygenated organic compounds, designs the synthesis of a new

substance on purpose.

SLO 8. Lists the rules for naming heterocyclic, alkaloid, mono and poly sugars, acquires the ability to predict synthesis methods, properties and new areas of application in various fields of industry,

SSB-25 Analytical chemistry

SLO 1. Knows the basics of the theory of fundamental fields of chemistry, the general regularities of chemical reactions used in analytical chemistry.

SLO 2. Knows the methodology of selecting analysis methods for solving specific theoretical and practical problems.

SLO 3. When discussing the obtained results, the analyst is able to apply the basic laws of chemistry.

SLO 4. Methods of registration and processing of results of chemical experiments; acquires theoretical knowledge about methods of detection, separation and quantification of substances.

SLO 5. Able to practically use chemical and instrumental analysis methods to solve specific analytical problems

SLO 6. Learns the main analytical and metrological features of the methods of analysis and identification of substances.

SSB-26 Physical chemistry

SLO 1. Knows the subject of physical chemistry, divides the history of development into stages, acquires the ability to use theories to solve practical problems.

SLO 2. Explains the composition of substances, the structure of atoms and molecules, the chemical bonds between them and the forces of interaction. Demonstrates experiences related to methods of obtaining substances and chemical properties and is able to draw conclusions and apply them.

SLO 3. Using the laws of thermodynamics, it provides

the possibility and direction of the reaction, the calculation of the thermal effect and heat capacity.

SLO 4. By comparing certain selected properties of the system with the composition of the system by the method of physico-chemical analysis, it determines the compounds formed when connections are formed between the components of the system, and predicts the field of application.

SLO 5. Acquires theoretical knowledge related to the fields of application of chemical energy, kinetic energy, energy generated in galvanic elements, electrolysis and corrosion processes and demonstrates experiments by proposing a project.

SLO 6. Chemical kinetics and catalysis shows the possibility and direction of the reaction by explaining the classification of the chemical reaction and the derivation of kinetic equations. When using a catalyst, he determines the factors affecting the activity of the reaction, acquires the ability to calculate the activation energy.

SLO 7. State diagrams are constructed by calculating the saturated vapor pressures of one- and two-component systems for the solubility of liquids in each other.

SLO 8. The study of theoretical methods also acquires the ability to apply physical chemistry in the solution of production and technological processes.

SSB-27 Mathematics

SLO 1. Must know the definitions of the concepts of numerical sequences and the limit of a logarithm and its calculation rules.

SLO 2. Cumulative sequences. They should be able to freely solve the actions on them and the examples of the limits brought to the number "e".

SLO 3. To know the known information about the function, one must learn to solve the problems related to its definition and values, limit.

SLO 4. They should master the theorems and formulas related to differential and integral calculus and learn the ability to apply them.

SLO 5. They should know how to apply the calculation methods of the indefinite integral to problem solving.

SLO 6. They should replace the Newton-Leibniz formula to the calculation and application of the definite integral.

SSB-28 Physics

SLO 1. Describes phenomena related to mechanics, molecular physics, electricity and magnetism, optics and atomic divisions of physics, solves problems related to the laws of physics, explains the physical nature of phenomena and processes in nature

SLO 2. Working in a team by performing laboratory work in a small group, achieves a common approach to problem solving, identifies and selects additional information resources for problem solving using information technologies

SLO 3. Improves the habit and skills of working with physical devices in the process of studying physical phenomena, builds and analyzes the algorithm of various types of problems, and conducts independent research by acquiring theoretical knowledge

SLO 4. Analyzes relevant information for professional purposes by explaining the physical essence of natural phenomena and processes, makes relevant generalizations, improves existing skills by applying the knowledge gained

SLO 5. Uses mathematical tools to solve physical problems, builds a mathematical model of processes, analyzes the course of events, describes the fundamental laws of nature, the natural scientific picture of the world with a unified system

SLO 6. Based on the laws of nature, chooses analysis methods to solve scientific and practical problems, participates in solving problems in accordance with skills and habits by

acquiring theoretical knowledge, conducts independent research

SSB-29 Chemical technology

SLO 1. It explains in detail the subject of chemical technology, the theoretical bases of general chemical technology, the technological schemes of production, and the processes taking place in them.

SLO 2. Researches the main raw material energy sources available in the chemical industry and other countries, acquires the ability to research the existing energy sources in our Republic.

SLO 3. Able to calculate material and heat balances of technological processes of various products using modern training and teaching methods.

SLO 4. Acquires the ability to schematically describe technological schemes of production, main devices, their structure, and the processes taking place in reactors.

SLO 5. Describes in detail the chemical technology of the production of inorganic and organic substances, the processes taking place in them.

SLO 6. The main technological processes existing in the world, the description of the processing industry, the ability to calculate the main indicators of technological processes are mastered.

SLO 7. Organization of laboratory work, plans to carry it out safely, acquires the ability to work on apparatus and devices.

SSB-30 Civil defense and primary medical aid

SLO 1. In the teaching of MM and first aid subjects, the student learns the main tasks of civil defense, the structure of the organization of MMTX, the causes and types of first aid.

SLO 2. During the teaching of the subject of civil

defense and first aid, he knows how to eliminate the consequences of FH, organize medical care during major industrial accidents, organize rescue and other urgent work.

SLO 3. Civil defense and first aid compare wartime emergencies with peacetime emergencies during the teaching of the subject .

SLO 4. Civil defense and first aid is able to assess the conditions that have arisen in the FH during the teaching of the subject, familiarize with dosimetric devices and use them.

SLO 5. During the teaching of the subject of civil defense and first aid, the FH student learns and applies the principles and methods of population protection, types of protection devices, and types of personal and medical protection.

SLO 6. During the teaching of the subject of civil defense and first aid, studies the organization of medical supply of MMTX institutions, the preparation of non-military units and the population.

SLO 7. During the teaching of the subject of civil defense and first aid, the Doctor organizes first aid and specialized medical aid.

SLO 8. During the teaching of the subject of civil protection and first aid, he knows evacuation measures, the essence of evacuation, the organization of communication and warning systems and the rules of their use.

SSIHE-B01 – 1. Microbiology and virology

SLO 1. The development history, goals and tasks of microbiology are studied

SLO 2. Morphology and anatomy of bacteria are studied

SLO 3. The systematics of microorganisms is studied

SLO 4. Ways of bacterial cell growth and reproduction are studied

SLO 5. The subject of the science of virology, the

history of its study and the role of viruses in nature are studied

SLO 6. The influence of the environment on the ecology of microorganisms is studied

SSIHE-B01 – 2. Ichthyology

SLO 1. Synthesizes roundmouths and fishes: morphological and physiological structure, lifestyle, distribution in nature, ecological importance, migration, comparative morphology of fishes.

SLO 2. Analyzes the morphological characteristics of animals included in the roundmouth class and the fish class.

SLO 3. Applies the anatomical structure of fish, physiological functions, lifestyle, distribution in nature, spawning period, hunting by humans.

SLO 4. Determines morphological characteristics and species diversity of fish.

SLO 5. Monitors the environment, natural resources and protected animal species, evaluates ecological forecasting, introduction of endangered species

SLO 6. Prevention of fish diseases and control of populations of animals that harm human health; application - applied in special sections such as animal husbandry, fishing, fish breeding, hunting.

SSIHE-B01 – 3. Chemistry of transition elements

SLO 1. Describes the position in the periodic system by characterizing transition elements in general

SLO 2. The ability to think about transition elements according to their structure and properties, determine the structure and properties of transition elements with modern analysis methods

SLO 3. Depending on the conditions, group IV and V transition elements demonstrate some reactions at different temperatures and pressures.

SLO 4. Analyzes group VI and VII by checking the reactivity of transitional elements and drawing conclusions by comparing the properties of their elements.

SLO 5. He is able to describe the mechanism of formation of cluster compounds in transition elements, differentiating the mechanisms of formation of chemical bonds between metals.

SLO 6. Group VIII transition elements and their compounds, explaining their physical and chemical properties and predicting their application areas

SLO 7. IB is able to calculate the stability of group elements and their compounds by providing information about their crystal structure.

SSIHE-B02 – 1. Chemistry of bioorganic natural physiologically active compounds

SLO 1. Acquires knowledge of the basic principles of structure, classification and nomenclature of organic compounds, their biological activity;

SLO 2. Learns the classification of organic reactions;

SLO 3. The main class gets acquainted with the classes of organic compounds;

SLO 4. Master the basic methods of synthesis of organic compounds;

SLO 5. Proteins, carbohydrates, fats, antibiotics, etc. learns spatial structure and properties;

SLO 6. Able to analyze, chemical and biological synthesis of biopolymers;

SLO 7. Get acquainted with enzymatic catalysis, enzymes and antibodies

SSIHE-B02 – 2. Higher mammals

SLO 1. Compares mammals according to their morphological and physiological structure, lifestyle,

distribution in nature, ecological importance.

SLO 2. Analyzes the morphological characteristics of animals included in the class of mammals

SLO 3. Compare and evaluate higher mammals according to their lifestyle and distribution in nature

SLO 4. Analyzes by comparative analysis according to morphological features and species diversity of primary and higher mammals.

SLO 5. Evaluates ways of introduction of mammals of agricultural and industrial importance based on scientific data.

SLO 6. Analyzes the lifestyle of mammals that harm human health and makes predictions, understanding the use of measures to combat them in special units .

SSIHE-B02 – 3. Plant stock

SLO 1. Understanding of vegetation, vegetation zones are distinguished depending on the nature of vegetation

SLO 2. Plant resources of deserts with different conditions are defined

SLO 3. Plant resources of mountainous areas are defined

SLO 4. The reserve of medicinal plants is studied in Azerbaijan

SLO 5. Plant resources are grouped according to economic characteristics

SLO 6. Plant resources used in agriculture and food industry are appropriated

SSIHE-B03 – 1. Closed chain hydrocarbons

SLO 1. Knows the subject of the subject of closed chain hydrocarbons, divides the history of development into stages, explains its theoretical basis and bases it on examples. He evaluates the possibilities of controlling the reaction according

to the structure and properties of the organic matter, demonstrates the conditions of conducting the reactions, the separation and purification methods of the new substance as a result of research experiments, and thinks about the possible areas of application.

SLO 2. Explains the types of isomerism and naming of cycloparaffins, aromatic, polynuclear condensed and non-condensed aromatic hydrocarbons, compares their production methods and chemical properties, synthesizes some representatives in the laboratory and demonstrates their properties.

SLO 3. Purposefully projects the synthesis of a new substance based on the relationship between the physical and chemical properties of aromatic oxygenated compounds (aldehydes, ketones, carbonic acids, etc.) demonstrates empirically.

SLO 4. Structure properties of quinones with attached cyclohexadienes, aromatic

SLO 5. Analyzes the conditions of transformation into oxycompounds, their participation in biological oxidation processes;

SLO 6. Differentiates aromatic nitrogenous organic compounds (amines, nitro-, amino-, diazo- and azo-compounds) from each other and compares the structure dependence of their similar and different aspects of their chemical properties. Synthesis of new representatives

SSIHE-B03 – 2. Basics of soil science

SLO 1. The goals and objectives of the science of soil science and its relationship with other sciences are studied

SLO 2. Soil-forming factors are clarified

SLO 3. The mechanical and physical-mechanical composition of the soil is studied

SLO 4. The structure of the soil and its structural

aggregates are defined

SLO 5. Water, heat and air conditions of the soil are determined

SLO 6. Geographic distribution patterns of soil and soil types are studied

SSIHE-B03 – 3. Membranology

SLO 1. The biology of biological membranes and their role in the activity and structure of the cell

SLO 2. New achievements in the study of biological membranes

SLO 3. Theoretical foundations, achievements and problems of modern cell biology;

SLO 4. Basic concepts and methods of cell biology to understand the structural and functional structure of cell organization

SLO 5. Research methodology of natural and artificial biological membranes and their use in practice

SLO 6. Using the methods of theoretical and experimental research in the study of plasmatic membranes and membranes of intracellular organelles.

SSIHE-B04 – 1. Higher nervous activity and sensory system

SLO 1. Knows the processes carried out in the nervous system as a result of this or that effect of the external environment

SLO 2. The condition you and the conditional reflector connect the working principles of the activity.

SLO 3. Typology and genetics of higher nervous activity, knows the definition of types of higher nervous activity.

SLO 4. Analyzes and evaluates the integrative function of the nervous system.

SLO 5. Analyzes physiological processes occurring

during sleep.

SLO 6. Learns and analyzes changes in the body in emotional situations .

SSIHE-B04 – 2. Inorganic synthesis

SLO 1. Determines the main synthesis methods of substances, characterizes the interaction between their (metals, non-metals and compounds) structure and properties, and investigates and analyzes the methods of purification of substances.

SLO 2. It predicts the processes reflecting the synthesis of metals and alloys by metallothermal methods, as well as the synthesis of substances (metals, non-metals and salts) by electrolytic methods. It investigates the methods of synthesis of metals by reducing oxides with hydrogen and demonstrates them through experiments.

SLO 3. Comparatively analyzes the methods of synthesis of non-metals, including silicon, boron, halogens and hydrogen , as well as the selection of suitable conditions and methods of purification of substances.

SLO 4. Learns the methods of synthesis of complex substances (oxides, acids, hydroxides, salts) and demonstrates them with experiments. Analyzes the selection of optimal conditions during synthesis processes.

SLO 5. Demonstrates the ability to know the methods of synthesis of metal and non-metal sulfides, carbides, hydrides of nitrides, peroxides and to perform related experiments in the laboratory.

SLO 6. Comparatively analyzes the methods of synthesis of complex compounds and demonstrates the experiments that reflect them.

SLO 7. Interprets synthesis processes by examining methods of control over the degree of purity of semiconductors. Analyzes methods of obtaining crystals from

solution and alloy.

SLO 8. The application of chemical thermodynamics in inorganic synthesis predicts processes reflecting heterogeneous topochemical reactions.

SSIHE-B0 4 – 3. Phytocenology

SLO 1. Typical features of phytocenoses, structure, its floristic composition, population composition of various species, role of various species in phytocenosis, abundance, productivity, etc. is determined

SLO 2. Classification and naming of phytocenoses; Association, formation and type of vegetation, the main vegetation unit of phytocenoses are studied

SLO 3. Agrophytocenoses; Discontinuous artificial plant groups formed as a result of human economic activity are defined

SLO 4. Succession and dynamics of biogeocenoses; The characteristics of the growth rhythm of species forming seasonal and annual phytocenoses are specified

SLO 5. Vital forms of plants; According to K. Raunkier, the classification of life forms of plants is given

SLO 6. Influence of geographical factors on vegetation is determined

SSIHE-B05 – 1. Cenopopulation of plants

SLO 1. Determines and compares the ontogenetic characteristics of the plant according to age periods and age states (germinating, juvenile, immature, virginal, young generative, middle-aged generative, old generative, subsenile, senile).

SLO 2. Evaluates the vitality and development dynamics of the senopopulation of plants.

SLO 3. Determines the signs of adaptation of individuals of different ages included in the population to

environmental conditions, analyzes the mechanism of the effect of the complex of abiotic and biotic factors on plants.

SLO 4. According to the level of students' knowledge, they are able to use modern technologies, certain methods and methods (as well as when performing laboratory work) when studying the ontogenetic characteristics of plants.

SLO 5.5. When studying the senopopulation of plants, it analyzes the structure of phytocenosis, the fluctuation and succession variability that occurs on scientific grounds.

SLO 6. Conducts the analysis of large and small life cycles of plants, as a result, is able to calculate their productivity in the population using modern methods (as well as correlation relations - through the SPS program)

SLO 7. Is able to analyze the place and position of the science of plant senopopulation in the system of biological sciences, and its development.

SSIHE-B05 – 2. Immunology

SLO 1. Knows the organization and functional features of the immune system.

SLO 2. Justifies the working principles of immune system components and the interaction between them.

SLO 3. Based on the knowledge of the molecular and cellular basis of the activity of the immune system, evaluates the role of the immune system in the ontogenesis of the body and its importance for human health.

SLO 4. It offers the mechanisms of the occurrence of immunopathologies that appear as a result of immune system dysfunction, and potential ways to prevent them.

SLO 5. Explains the mechanisms of antibacterial immunity.

SLO 6. Knows the basics of antiviral immunity.

SSIHE-B05 – 3. Selected lectures on organic chemistry

SLO 1. The ability to determine chemical bonds, their parameters, the effect of existing chemical bonds in functional groups on the overall electron density of the molecule and the resulting electronic effects.

SLO 2. Comparatively analyzes the effect of joining on the properties of matter and demonstrates the acquired knowledge and skills with experiments.

SLO 3. Comparatively analyzes the acid-base property of different classes of organic substances with examples, demonstrates the ability to apply experiments to the effect of various factors on the acid-base property of a compound.

SLO 4. Homolytic and heterolytic explains the mechanism of reactions on examples based on the properties of organic compounds, and compares the similarities and differences of reactions with the same mechanism.

SLO 5. Comparatively analyzes the activity of carbonyl in carbonyl compounds, demonstrates with experiments the influence of the nature of the organic radical on the mechanism of condensation and reactions with nucleophiles.

SLO 6. Knows the properties of nitrogenous organic compounds, analyzes the methods of synthesis of new representatives, the mechanism of transformation processes, predicts the fields of application.

SSIHE-B06 – 1. Chemistry of complex compounds

SLO 1. Explains the theories put forward by many scientists in the field of complex compounds

SLO 2. Explains the chemical bond in complex compounds and its types, differentiating the mechanisms of formation of chemical bond.

SLO 3. Categorizes the types of complex compounds, methods of preparation, components and can calculate the effective atomic number according to Sicvik's rule.

SLO 4. Acquires theoretical information about

isomerism in complex compounds, its types and properties.

SLO 5. Determines the classification, structure and properties of complex compounds and predicts the fields of application

SLO 6. He is able to calculate the continuity of complex compounds, the rules of trans-effect, solving the discontinuity constant in complex compounds and related problems

SLO 7. It explains the formation of complex compounds on the basis of quantum-mechanical theories

SLO 8. The dependence of the ability of metals to form complex compounds on their position in the periodic system, obtaining the property of complexation on the basis of theoretical knowledge, demonstrates in experiments how to obtain precipitates of complex compounds in different aggregates and colors.

SSIHE-B06 – 2. Plant growing

SLO 1. Life factors of plants are studied. Soil and its agronomic properties are determined.

SLO 2. Soil cultivation rules and fertilizing methods are studied.

SLO 3. The methods of preparing seeds for sowing and caring for agricultural plants are studied.

SLO 4. The main diseases and pests of field crops and methods of combating them are studied.

SLO 5. Cereal crops and their cultivation methods are studied.

SLO 6. The agrotechnics of growing legumes and technical crops are studied.

SSIHE-B06 – 3. Physiology of individual development

SLO 1. To provide information about the subject of personal development, development and research methods. Studying the structure and types of germ cells.

SLO 2. To study the development of fertilization and the

stages that occur at this time.

SLO 3. Learning the characteristics of the types of division.

SLO 4. Students should master the essence of blastula formation and gastrulation process.

SLO 5. To discuss the mechanism of formation of extra-embryonic organs, and to explain processes such as differentiation, determination, integration, induction.

SLO 6. To provide knowledge about the stages of organogenesis, the development and formation of ectoderm, endoderm, and mesoderm-derived organs.

SSIHE-B07 – 1. Animal ecology

SLO 1. The student evaluates the knowledge gained during the study of the course "Ecology of animals" in the monitoring of the environment, natural resources and protected animal species, in ecological forecasting, and in the introduction of economically important species.

SLO 2. This knowledge is also used in the control of populations of animals that harm human health, applied ecology in animal husbandry, fishing, hunting, etc. used in special sections such as

SLO 3. Analyzes the main regularities of the influence of environmental factors on animals and the adaptation of animals to the influence of these factors.

SLO 4. Analyzes the characteristics of the habitat of animals.

SLO 5. Uses the structure and dynamics of animal associations.

SLO 6. Uses knowledge such as the study of the principles and application of animal protection, more efficient use of them.

SSIHE-B07 – 2. Medicinal plants:

SLO 1. The biological diversity and botanical characteristics of medicinal plants in the flora of Azerbaijan are determined

SLO 2. The methods of studying raw material resources of medicinal plants of Azerbaijan are studied

SLO 3. Medicinal plants are characterized by their active ingredients

SLO 4. Methods of using medicinal plants in market economy conditions are studied

SLO 5. Botanical description of medicinal plants from different families is given

SLO 6. The use of medicinal plants of Azerbaijan in various diseases is studied

SSIHE-B07 – 2. Chemistry of rare elements

SLO 1. Acquires knowledge about the position of rare and scattered elements in the periodic system, their distribution in the earth's crust, their production in industry, and their importance for science and technology.

SLO 2. Demonstrates theoretical information about methods of obtaining rare elements of group I of the periodic system, distribution in nature, physical and chemical properties in the laboratory.

SLO 3. Interprets information about beryllium, a rare element of group II of the periodic system, distribution in nature, physical-chemical properties, application, and important minerals.

SLO 4. Acquires the ability to distinguish rare elements of the III group of the periodic system - both gallium and scandium subgroups, as well as lanthanoid and actinoid elements in nature, by acquiring knowledge about their sources, physicochemical properties, important compounds and minerals.

SLO 5. It schematically describes the methods,

properties, fields of application, and important combinations of the main and additional subgroup elements of the IV group of the periodic system.

SLO 6. Experimentally demonstrates the reactions reflecting the properties of rare elements of group V of the periodic system.

SLO 7. Summarizes the materials related to the physico-chemical and biological properties of the rare elements of the VI and VII groups, their distribution in nature, physico-chemical properties, methods of acquisition, industrial production.

SSIHE-B0 8 – 1. Chemical basis of life activity

SLO 1. Forms an analytical way of thinking by presenting living samples from different worlds in comparison from primitive to higher, - knows the molecular genetic level.

SLO 2. Acquires scientific-based broad theoretical knowledge about organic substances, their classification, importance in wild nature.

SLO 3. Learn more about the cell in the lesson "The cell is the basis of life".

SLO 4. A tissue is known to be cells united by a common origin, structure and functions.

SLO 5. Learns that all living things on earth exist as isolated individuals that make up the organism level.

SLO 6. Learn about the active interaction of living and non-living matter of the planet and the biological cycle of energy.

SSIHE-B08 – 2. Entomology

SLO 1. The aims and tasks of entomology are studied

SLO 2. Acquaintance with insects is carried out

SLO 3. Methods of combating plant pests are studied

SLO 4. Pests that feed on various plants. Acquaintance

with flat-winged insects (grasshoppers, wasps, wasps), beetles, scales

SLO 5. General information about plant diseases and the causes of diseases in plants are investigated

SLO 6. Organization of protection of plants from pests and diseases

SSIHE-B08 – 3. Animal genetics and ecological genetics

SLO 1. The history of the development of the science of ecological genetics, starting from ancient times. to interpret the materialistic and idealistic views of the ancient philosophers who lived, as well as the views of the scholars of the Middle Ages and the Renaissance. Since the beginning of the 20th century, tracing the path of development of genetics as a free science, analyzes and evaluates data.

SLO 2. Interpretation of extensive information about the subject and methods of study of ecological genetics, as well as methods of studying modern ecological genetics and animal genetics.

SLO 3. One of the main features of the living world is the emergence of adaptability in phylogeny and ontogeny, the occurrence of adaptation as a result of natural selection, the characteristics of the structure or function of organisms under the concept of adaptation, and analyzes the data.

SLO 4. The integration of genetic material in different ways in the evolutionary process analyzes the manifestation of the unity of adaptive reactions at each structural level of living organisms.

SLO 5. Defines and summarizes the study of adaptation of organisms to abiotic and biotic conditions, natural selection as the main factor that forms adaptability in the structure and function of organisms.

SLO 6. The study of the genetic system of eukaryotic

and prokaryotic organisms, analyzes the changes in the genetic system of eukaryotes, information about regulatory and coding areas in eukaryotes.

SSIHE-B09 – 1. Chemistry of high molecular compounds

SLO 1. Knows the subject of the YMBK subject, divides the development history into stages, explains the theoretical foundations (general properties of polymers, phase aggregate states, synthesis methods) and bases them on examples. Evaluates the possibilities of controlling the polarization according to the structure and properties of polymers, demonstrates the conditions for conducting reactions, the properties of new polymer substances as a result of research experiments, explains the reasons for the dependence of the chemical and mechanical properties of polymers on their structures based on the methods of obtaining polymers

SLO 2. Mastered how and by which methods to synthesize polymers from monomers, investigates the functionality of monomers (functional groups, unsaturated bonds, independent atoms) depending on their nature, and the reactions of various nature.

SLO 3. Learned that high molecular compounds, due to their large size, form structures of various shapes, and explains the reasons why polymers have fibrillar and globular structures.

SLO 4. Due to the presence of various functional groups in the polymer macromolecule, it is able to reveal the differences in their chemical reactions and determine specific laws.

SLO 5. It was analyzed that the links (manuals) involved in the reaction in polymers have different reactivity due to their different configurations.

SLO 6. Knows about industrially produced synthetic polymers, as well as important representatives of natural polymers widely distributed in nature, their main fields of application.

SSIHE-B09 – 2. Enzymology

SLO 1. The chemical nature of enzymes is determined and structure is studied

SLO 2. General properties of enzymes, its specificity and thermolability are studied

SLO 3. Mechanism of action of enzymes, role of enzyme-substrate complex is defined

SLO 4. Modern classification and nomenclature of enzymes is specified

SLO 5. Enzyme activity regulation mechanisms are defined

SLO 6. Application of enzymes fields are studied

SSIHE-B09 – 3. Fauna of Azerbaijan

SLO 1. Determines the history of the development of the fauna of Azerbaijan, the morphological and physiological structure of invertebrates and vertebrates, their way of life, their distribution in nature, their ecological importance, the methods of analysis of vertebrates based on their comparative morphology, their role in evolution.

SLO 2. Analyzes the comparative morphological characteristics of invertebrates and vertebrates

SLO 3. Based on his previous training, the student explains the anatomical structure, physiological functions, lifestyle, distribution and protection of the animal.

SLO 4. The student differentiates, classifies and correlates invertebrates and vertebrates living in Azerbaijan according to their morphological characteristics and species diversity.

SLO 5. The student uses the knowledge gained during the study of the subject "Fauna of Azerbaijan" in monitoring the environment, natural resources and protected animal species, in ecological forecasting, and in the scientific justification of the introduction of economically important species.

SLO 6. This knowledge can also be used in the control of populations of invertebrates and vertebrates that harm human health, in animal husbandry, fishing, hunting, etc. makes predictions by understanding its use in special sections such as

SSIHE-B10 – 1. Modern training technologies

SLO 1. Acquires knowledge about the education system of the Republic of Azerbaijan, education policy, concept of education and development.

SLO 2. Able to design educational program components using active and interactive learning technologies.

SLO 3. Knows that each country has its own education system, learns the concept of education and development.

SLO 4. Knows how to use pedagogical technologies during the lesson.

SLO 5. Interprets the main characteristics of training technologies, analyzes and applies pedagogical technologies, compares traditional and interactive training. Able to apply interactive training methods, knows and analyzes diagnostic issues, informational principles arising from it.

SLO 6. Knows and demonstrates how to use modern learning technologies in the teaching process, knows and demonstrates the stages, structure, and application of didactic game technologies. Has the ability to use distance learning technologies in teaching. It has the development of pedagogical thinking through the humanization and humanitarianization of training.

SSIHE-B10 – 2. Fundamentals of educational management

SLO 1. Knows the importance, types, principles, relationships between them, and the structure and content of subject curricula, "state standards and state programs (curriculums) in the general education system", which is the legal guarantee of the educational policy implemented in the Republic of Azerbaijan, and applies it in the educational process.

SLO 2. Determination of learning objectives, components of content standards: knowledge and its categories; knows the basics of activity and its types, educational taxonomies, learning strategies, learning process and principles of its organization and relates it to activity.

SLO 3. H. Gardner's theory serving effective organization of training - Miscellaneous

applies understanding, makes comparisons, generalizes, and communicates attitudes.

SLO 4. Explains the importance and role of using reading strategies in elementary grades.

SLO 5. The use of ICT in Azerbaijani schools is an integral part of the state's educational policy, the planning of training on the subject, integration, its levels, and integration in primary classes are mastered, and they are used in their activities.

SLO 6. Understands the importance of the education system, the concept of personality-oriented education based on competence, and the renewal of training technologies, knows the concept, methods and means of assessment in the general education system of the Republic of Azerbaijan, the textbook policy in the general education system, the main components of textbook sets, and takes into account the educational process takes

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