



CATALOG OF ELECTIVE DISCIPLINES
For students in the direction of preparation 6B082 Animal production
Brief description of the elective disciplines of the educational program 6B08201 Animal production

EPG	EP	Form of education	The name of discipline	Code of discipline subject	Discipline cycle	Component	Number of credits	Level of training	Department	Course	Academic period	Pre-requisites	Post-requisites	Brief content of the discipline	Key learning outcomes	Name of the alternative discipline
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Labor protection and basics of life safety	OTOBZh 1109	GER	Elective subjects	5.0	Bachelor	Agrarian Technique and Technology	1	2			The discipline contributes to the formation of students' knowledge, practical skills to create safe and harmless living conditions, to protect the population and production personnel and objects of the national economy from the possible consequences of emergency situations. It also studies the peculiarities of labor protection for women and youth, supervision and control of the implementation of labor protection legislation and responsibility for violation of labor protection requirements.	Make calculations in heat engineering, thermodynamics and electrical engineering, choose the correct operation of electrical and thermal equipment, analyze hazardous and harmful production factors, study the environment and life safety requirements	Basics of anti-corruption culture, Basics of economics and law, Innovative entrepreneurship, Methods of scientific researches
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Innovative entrepreneurship	IP 1109	GER	Elective subjects	5.0	Bachelor	Economy	1	2			Form students' knowledge of the fundamental concepts of innovative development, modern approaches to the implementation of entrepreneurial activity in the field of new technologies to ensure the competitiveness of an innovative enterprise on the market. Understand the economic essence of innovative entrepreneurship, business planning, venture financing and know the types of firms with venture capital. Possess skills in risk management, human resource management, innovative management and innovative processes, as a condition for economic growth	Analyze in a logical and quantitative way the conditions for the development of production and evaluate the competitiveness of created products on the principles of engineering, study innovative entrepreneurship and anti-corruption culture, formulate inventions	Basics of anti-corruption culture, Basics of economics and law, Labor protection and basics of life safety, Methods of scientific researches
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Basics of anti-corruption culture	OAK 1109	GER	Elective subjects	5.0	Bachelor	Economy	1	2			The discipline examines the theoretical and methodological foundations of the concept of "corruption" and examines the improvement of socio-economic relations of the Kazakh society as a condition for combating corruption, psychological features of the nature of corrupt behavior, formation of anti-corruption culture, features of formation of anti-corruption culture of youth, ethnic features of formation of anti-corruption culture, moral and ethical responsibility for corruption in various spheres. Discipline allows you to learn about legal responsibility for corruption offenses	Analyze in a logical and quantitative way the conditions for the development of production and evaluate the competitiveness of created products on the principles of engineering, study innovative entrepreneurship and anti-corruption culture, formulate inventions	Basics of economics and law, Innovative entrepreneurship, Labor protection and basics of life safety, Methods of scientific researches

B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Basics of economics and law	0BEP 1109	GER	Elective subjects	5.0	Bachelor	Economy	1	2				The discipline promotes knowledge of the subject of economic theory and methods of research, the basis of public production and forms of public economy, the mechanism of functioning of the market system, production, costs and income of the firm, national economy. Give an assessment of economic growth and instability of the market economy, inflation and unemployment as manifestations of economic instability. Demonstrate knowledge and skills in the financial and monetary credit system in the national economy and economic security. To master the basics of the theory of the state and law, the basics of constitutional, administrative, civil, labor, family, criminal law.	Analyze in a logical and quantitative way the conditions for the development of production and evaluate the competitiveness of created products on the principles of engineering, study innovative entrepreneurship and anti-corruption culture, formulate inventions	Basics of anti-corruption culture, Innovative entrepreneurship, Labor protection and basics of life safety, Methods of scientific researches	B078 - «Animal breeding»
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Methods of scientific researches	MNI 1109	GER	Elective subjects	5.0	Bachelor	Cadastre and valuation	1	2				Statement of a scientific problem based on the discovery of contradictions between the currently available knowledge about the object of research and the knowledge necessary for the practical solution of the problem demanded by society. Selection of the topic and scientific justification of its relevance for practical application. Formulation of a hypothesis, development of a research plan. Methods of theoretical and experimental research and registration of scientific results.	To apply theoretical and practical knowledge about environmental factors, understand the basic patterns of interaction between living organisms and the environment, to create safe and harmless living conditions. To apply leadership qualities in solving environmental problems of our time based on the knowledge of an anti-corruption culture. To collect and interpret information for the implementation of innovative entrepreneurial activities.	Basics of anti-corruption culture, Basics of economics and law, innovative entrepreneurship, Labor protection and basics of life safety	B078 - «Animal breeding»
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Python language and data analysis	YaPA D 2222	BS	Elective subjects	3.0	Bachelor	Higher mathematics	2	1				The course is dedicated to an in-depth study of the Python data structure, introduces classical programming paradigms, and deals with the NumPy library to approach linear algebra and its algorithms; students use these deepening to solve concrete problems. An introduction to SQL queries completes the year with applications to Web databases.	To apply knowledge and understanding of facts, theories on the content of any information; to have the skills of learning to express their thoughts in writing and orally (listening, speaking, reading and writing); to demonstrate knowledge and understanding of foreign languages for special purposes and professional terminology for conducting production activities in the livestock industries; to know the basic concepts of economic theory, knowledge of the main events in the history of animal husbandry, as the consumption of livestock products per capita; to own the method of analysis of economic phenomena and processes; modern methods of mathematical statistics; to collect and interpret statistical data, to know the basics of.	Designing software systems	B078 - «Animal breeding»
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Designing software systems	PPS 2222	BS	Elective subjects	3.0	Bachelor	Information and communication technologies	2	1				Basic software design concepts, Goals and stages of software design. The use of modeling in software design. The purpose of the language UML. Software architecture. Architecture design. Design classes. Refinement analysis classes. Designing the interaction of classes. The use of components in the design of software. Design in specific classes and design in interfaces. Designing software components.	To apply knowledge and understanding of facts, theories on the content of any information; to have the skills of learning to express their thoughts in writing and orally (listening, speaking, reading and writing); to demonstrate knowledge and understanding of foreign languages for special purposes and professional terminology for conducting production activities in the livestock industries; to know the basic concepts of economic theory, knowledge of the main events in the history of animal husbandry, as the consumption of livestock products per capita; to own the method of analysis of economic phenomena and processes; modern methods of mathematical statistics; to collect and interpret statistical data, to know the basics of.	Python language and data analysis	B078 - «Animal breeding»
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Biophysics	Bio 2208	BS	Elective subjects	4.0	Bachelor	Basics of physics, dynamics and electromagnetism, General biology of organisms, Higher Mathematics*, Molecular and cellular biology	2	1				Biophysics considers the physical and chemical phenomena occurring in living organisms, which underlie elementary life processes, as well as the action of physical factors on the body. The main task of biophysics is to study the processes associated with the transformation of the chemical energy of the components of living matter into other types of energy - mechanical and osmotic work, electrical and radiation energy.	To form the competencies of biophysical phenomena in animal organisms. ON 4 - Know the patterns of interaction of aquatic organisms, the ecological groups of aquatic organisms; features of natural waters, their interaction and processes; chemical composition of natural waters. Examine microorganisms and viruses. The use of mathematical methods of statistical analysis in relation to animals. Know the physical aspects of the existence of wildlife.	Molecular biophysics	B078 - «Animal breeding»

B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Molecular biophysics	MB 2208	BS	Elective subjects	4.0	Bachelor	Biology, Plant Protection and quarantine	2	1	Bases of physics, thermodynamics and electromagnetism, General biology of organisms, Higher Mathematics*, Molecular and cellular biology	Production technology of animal husbandry products	This course is aimed at studying biological macromolecules in solution, macromolecules, coil and globule, conformations of macromolecules, internal macromolecular interactions and bonds, water structure and hydrophobic interactions, interaction between macromolecules in solution. The discipline studies protein biophysics: composition, primary structure of proteins, secondary structure of proteins, supersecondary structures, domains, tertiary and quaternary protein structures, nucleation model of coagulation, biophysics of nucleic acids, the main reasons for the evolution of living systems. Students master the Chargaff rules, the primary structure of nucleic acids, the secondary structure of nucleic acids, the double helix of DNA, the mechanism of self-reproduction and information transfer to daughter cells, protein synthesis, the biological code, the Jacob-Manot regulation of protein synthesis, enzyme catalysis Enzymes, the Fisher model, the theory of induced structural correspondence, regulation of cellular processes.	To apply knowledge and understanding of facts, phenomena, theories and complex dependencies of the main patterns of inheritance of traits and principles of heredity; to demonstrate knowledge and understanding of the chromosome theory of heredity; to understand the importance of the principles and role of heterosis in increasing the productivity of agricultural animals and birds; to apply knowledge and understanding of the genetic parameters of selection, selection and breeding work in the livestock industries. To demonstrate knowledge and understanding of the structure and properties of organic and inorganic substances; to understand the significance of the principles of the laws governing the flow of physical and chemical processes, metabolism and energy in the animal body, to apply theoretical and practical knowledge on experimental principles and methods of inorganic and organic chemistry.	Biophysics
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Digital technologies in animal husbandry	CTZh 2221	BS	Elective subjects	4.0	Bachelor	Technology of production of products of stock-raising	2	2	Breeding and selection of agricultural animals, Feeding of agricultural animals	Internship	The discipline studies the digital technologies in animal husbandry, production processes in real time, animal-centered feeding, production and keeping systems, continuous collection, analysis and use of information, traceability of origin and quality of products throughout the production chain, which prevents the spread of diseases and illegal trade in livestock products.	To apply theoretical and practical knowledge of the basics of fodder production; to demonstrate knowledge and understanding of the characteristics of the main natural forage crops for the preparation of norms and diets for animal feeding; to have training skills in developing feeding norms and calculating rations for farm animals using specialized computer programs; to know the basic concepts of economic theory, knowledge of the main events in the history of animal husbandry, as the consumption of livestock products per capita; to own the method of analysis of economic phenomena and processes, modern methods of mathematical statistics; to collect and process statistical data; to know the basics of	Informational system in animal husbandry
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Informational system in animal husbandry	ISZh 2221	BS	Elective subjects	4.0	Bachelor	Technology of production of products of stock-raising	2	2	Breeding and selection of agricultural animals, Feeding of agricultural animals	Internship	The course "Information system in animal husbandry" provides an overview of how the IAS system. Registration of zootechnical events in information-analytical system (IAS). Forms of tribal reporting. Automated workplace. Solving problems on the technology of production and processing of livestock and crop production; Calculation of diets for farm animals with the help of specialized computer programs	To apply theoretical and practical knowledge of the basics of fodder production; to demonstrate knowledge and understanding of the characteristics of the main natural forage crops for the preparation of norms and diets for animal feeding; to have training skills in developing feeding norms and calculating rations for farm animals using specialized computer programs; to know the basic concepts of economic theory, knowledge of the main events in the history of animal husbandry, as the consumption of livestock products per capita; to own the method of analysis of economic phenomena and processes, modern methods of mathematical statistics; to collect and process statistical data; to know the basics of	Digital technologies in animal husbandry
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Animal Physiology	FZh 3227	BS	Elective subjects	3.0	Bachelor	Microbiology and biotechnology	3	1	General biology of organisms, Molecular and cellular biology	Breeding and selection of agricultural animals, Obstetrics and biotechnology of reproduction	To apply theoretical and practical knowledge of the anatomical and morphological structure of agricultural animals and birds; to understand the significance of the principles of features and patterns of physiological processes and functions of individual body systems of agricultural animals and birds; to know the physiological, biological, biochemical, morphological methods of scientific research for different animal species and to apply them in the area under study.	Animal homeostasis	

B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Animal homeostasis	GZh 3227	BS	Elective subjects	3.0	Bachelor	Biology, Plant Protection and quarantine	3	1	General biology of organisms, Molecular and cellular biology	Breeding and selection of agricultural animals, Obstetrics and biotechnology of reproduction	The discipline studies the definition of the concept of homeostasis, types of homeostasis, genetic homeostasis, structural homeostasis, homeostasis of the internal environment of the body, immunological homeostasis. Students master the mechanisms of homeostasis regulation: neurohumoral and endocrine, hormonal regulation of homeostasis, organs involved in the regulation of homeostasis. The course is aimed at studying the general principles of homeostatic reactions, species specificity of homeostasis, age-related features of homeostasis, pathological processes accompanied by a violation of homeostasis.	To apply theoretical and practical knowledge of the anatomical and morphological structure of agricultural animals and birds; to understand the significance of the principles of features and patterns of physiological processes and functions of individual body systems of agricultural animals and birds; to know the physiological, biological, biochemical, morphological methods of scientific research for different animal species and to apply them in the area under study	Animal Physiology
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Mechanization of livestock production	MPP Zh 3223	BS	Elective subjects	3.0	Bachelor	Agrarian Technique and Technology	3	1	Higher Mathematics*	Feeding of agricultural animals, Production technology of animal husbandry products	The discipline studies general information about farms and complexes, mechanization of water supply to livestock farms and pastures, preparation and distribution of feed, milking, shearing and preventive bathing of sheep, comprehensive mechanization of production processes; students master intrafarm transport, machinery and equipment for processing raw materials of animal origin, the maintenance of machinery and equipment at livestock farms and complexes.	To understand the importance of the principles of operation of machines and equipment for the primary processing of raw materials of animal origin; to demonstrate knowledge and understanding of complex mechanization of production processes, such as milking cows and primary processing of milk and meat; to carry out a sanitary and hygienic assessment of various methods of removal, storage and disinfection of manure.	Farmer's machine and tractor park
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Farmer's machine and tractor park	MTP F 3223	BS	Elective subjects	3.0	Bachelor	Agrarian Technique and Technology	3	1	Higher Mathematics*	Feeding of agricultural animals, Production technology of animal husbandry products	During the course, the theoretical foundations of the production operation of machine-tractor units, the technical support of technologies in animal husbandry, and transport in agricultural production are studied. Students master the technical operation of machines, design and analysis of the use of the machine and tractor fleet, production and technological services.	To understand the importance of the principles of operation of machines and equipment for the primary processing of raw materials of animal origin; to demonstrate knowledge and understanding of complex mechanization of production processes, such as milking cows and primary processing of milk and meat; to carry out a sanitary and hygienic assessment of various methods of removal, storage and disinfection of manure.	Mechanization of livestock production
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Forage production with fundamentals of agronomy and botany	KOA B 3218	BS	Elective subjects	3.0	Bachelor	Agriculture and plant growing	3	1	Animal Morphology	Feeding of agricultural animals	Knows the theoretical and practical bases of feed production as a science of obtaining high and stable yields of forage crops, characteristics of the main natural forage lands; applies technology of preparation and storage of feed; analyzes the improvement of natural hayfields and pastures.	To apply theoretical and practical knowledge of the basics of fodder production; to demonstrate knowledge and understanding of the characteristics of the main natural forage crops for the preparation of norms and diets for animal feeding; to have training skills in developing feeding norms and calculating rations for farm animals using specialized computer programs.	Forage production
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Forage production	Kor 3218	BS	Elective subjects	3.0	Bachelor	Agriculture and plant growing	3	1	Animal Morphology	Feeding of agricultural animals	The discipline is intended for the formation of theoretical knowledge and practical skills in the evaluation of natural forage lands (haymaking or pasture), the development of measures that are necessary to improve the natural and sown grasslands, and will contribute to obtaining high yields of green mass, determining the nature of the economic use of a particular forage land and the preservation/improvement of its species composition, in the organization of fodder, in compliance with all known technologies.	To apply theoretical and practical knowledge of the basics of fodder production; to demonstrate knowledge and understanding of the characteristics of the main natural forage crops for the preparation of norms and diets for animal feeding; to have training skills in developing feeding norms and calculating rations for farm animals using specialized computer programs.	Forage production with fundamentals of agronomy and botany
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	The fundamentals of Veterinary science	OV 3224	BS	Elective subjects	3.0	Bachelor	Technology of production of products of stock-raising	3	1	Animal Morphology	Camel breeding, production technology of shabab, meat and wool, Cattle breeding technology of milk and beef production, Goat breeding, production technology of milk, meat, wool and camlmera, Horse breeding, production technology of horse meat and carnis, Obstetrics and biotechnology of reproduction, Poultry technology of poultry products, Sheep.	The course reveals the fundamentals of pathology, diagnosis, prevention, treatment and measures of elimination of diseases of various ethologies, basics of pharmacology, surgery, basics of internal non-communicable and surgical diseases of animals, diseases of lactal gland, obstetrics and gynecology, infectious diseases, basics of epizootology and parasitology; students master methods of clinical diagnosis of internal non-communicable and surgical diseases of animals.	To apply theoretical and practical knowledge of animal fertilization; to demonstrate knowledge and understanding in identifying signs of pregnancy; to have training skills in the diagnosis, prevention, treatment and elimination of animal diseases of various ethologies; to understand the meaning of the principles of the basics of veterinary medicine.	Organization of veterinary affairs

B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Organization of veterinary affairs	OVD 3224	BS	Elective subjects	3.0	Bachelor	Veterinary sanitation	3	1	Animal Morphology	Camel breeding, production technology of shabat, meat and wool, Cattle breeding technology of milk and beef production, Goat breeding, production technology of milk, meat, wool and cashmere, Horse breeding, production technology of horse meat and curms, Obstetrics and biotechnology of reproduction, Poultry, technology of poultry products, Sheep production, technology of	Forms the skills of organizing veterinary activities in economic entities for the prevention and elimination of animal diseases of infectious and non-infectious etiology.	To apply theoretical and practical knowledge of animal fertilization; to demonstrate knowledge and understanding in identifying signs of pregnancy; to have training skills in the diagnosis, prevention, treatment and elimination of animal diseases of various etiologies; to understand the meaning of the principles of the basics of Veterinary medicine.	The fundamentals of Veterinary science
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Physical and chemical research methods	FHMI 3226	BS	Elective subjects	3.0	Bachelor	Physics and chemistry	3	1	Analytical and physical and colloid chemistry, Bases of physics, Inorganic and organic chemistry	Primary processing technology of animal origin raw materials, Processing and storage technology of milk and meat, Zoohygiene the basics of designing livestock facilities	Knows the classification of physical and chemical analysis methods, general characteristics of the methods, the indicator electrode and the reference electrode, classification of chromatographic methods, ion exchange and sediment chromatography, gas and liquid chromatography, understands equilibrium and non-equilibrium electrochemical systems, sensitivity and selectivity of physicochemical methods of analysis; applies electrogravimetric, conductometric, potentiometric, polarographic, coulometric methods, chromatography in quantitative analysis, electrochemical methods of analysis.	To demonstrate knowledge and understanding of the structure and properties of organic and inorganic substances; to understand the significance of the principles of the laws governing the flow of physical and chemical processes, metabolism and energy in the animal body; to apply theoretical and practical knowledge on experimental principles and methods of inorganic and organic chemistry.	Chemistry of high-molecular compounds
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Chemistry of high-molecular compounds	FVS 3226	BS	Elective subjects	3.0	Bachelor	Physics and chemistry	3	1	Analytical and physical and colloid chemistry, Bases of physics, Inorganic and organic chemistry	Primary processing technology of animal origin raw materials, Processing and storage technology of milk and meat, Zoohygiene the basics of designing livestock facilities	Discipline considers basic concepts and definitions of the chemistry of high-molecular compounds, the nomenclature of polymers, structure and physico-mechanical properties. Students master methods of obtaining high-molecular substances, chain reactions and stepwise processes of macromolecule formation, chemical reactions of polymers, methods of identification of macromolecules, the role of polymers in wildlife and their significance in technology.	To demonstrate knowledge and understanding of the structure and properties of organic and inorganic substances; to understand the significance of the principles of the laws governing the flow of physical and chemical processes, metabolism and energy in the animal body; to apply theoretical and practical knowledge on experimental principles and methods of inorganic and organic chemistry. To apply theoretical and practical knowledge of the basics of fodder production; to demonstrate knowledge and understanding of the characteristics of the main natural forage crops for the preparation of norms and diets for animal feeding; to have training skills in developing feeding norms and calculating rations for farm animals using specialized computer programs.	Physical and chemical research methods
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Methods of Mathematical Modeling	MMM 3240	BS	Elective subjects	2.0	Bachelor	Higher mathematics 1*	3	1	Higher mathematics 1*	Statistical analysis and data visualization	The discipline will allow students to use mathematical methods to study various processes. The course contains the following sections: basics of power series; application of power series to generating functions and discrete variables, integration over intervals; laws of distribution, elements of correlation theory.	know the basic concepts of economic theory, knowledge of the main events in the history of the development of livestock farming, such as the consumption of livestock products per capita; master the method of analyzing economic phenomena and processes, modern methods of mathematical statistics, collect and process statistical data; know the basics of production management in the management system of livestock organizations.	Mathematical Methods in Biology 1

B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Mathematical Methods in Biology I	NIMB 3242	BS	Elective subjects	2.0	Bachelor	Biology, Plant Protection and quarantine	3	1	Higher Mathematics* I	Statistical analysis and data visualization	The discipline will allow students to use mathematical methods to study various processes. The course contains the following sections: application of power series to generating functions and discrete variables, basic concepts of probability theory, statistical data, descriptive and graphical methods of data analysis, statistical estimation, distribution laws, elements of correlation theory.	Know the basic concepts of economic theory, knowledge of the main events in the history of the development of livestock farming, such as the consumption of livestock products per capita, master the method of analyzing economic phenomena and processes, modern methods of mathematical statistics, collect and process statistical data, know the basics of production management in the management system of livestock organizations.	Methods of Mathematical Modeling I
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Statistical analysis and data visualization	SAV D 3225	BS	Elective subjects	3.0	Bachelor	Higher mathematics	3	2	Python language and data analysis	Cattle breeding technology of milk and beef production, Horse breeding, production technology of horse meat and cumis, Production technology of animal husbandry products, Sheep breeding, technology of wool, mutton production	to know the basic concepts of economic theory, knowledge of the main events in the history of animal husbandry, as the consumption of livestock products per capita; to own the method of analysis of economic phenomena and processes, modern methods of mathematical statistics; to collect and process statistical data; to know the basics of production management in the management of livestock organizations;	Data analysis and interpretation	
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Data analysis and interpretation	AID 3225	BS	Elective subjects	3.0	Bachelor	Computer science	3	2	Python language and data analysis	Cattle breeding technology of milk and beef production, Horse production technology of horse meat and cumis, Production technology of animal husbandry products, Sheep breeding, technology of wool, mutton production	to know the basic concepts of economic theory, knowledge of the main events in the history of animal husbandry, as the consumption of livestock products per capita, to own the method of analysis of economic phenomena and processes, modern methods of mathematical statistics; to collect and process statistical data; to know the basics of production management in the management of livestock organizations;	Statistical analysis and data visualization	
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Obstetrics and biotechnology of reproduction	ABR 3217	BS	Elective subjects	3.0	Bachelor	Technology of production of products of stock-raising	3	2	Animal Morphology, Animal Physiology, The fundamentals of Veterinary science	Production technology of animal husbandry products	To apply theoretical and practical knowledge of animal fertilization; to demonstrate knowledge and understanding in identifying signs of pregnancy, to have training skills in the diagnosis, prevention, treatment and elimination of animal diseases of various ethologies; to understand the meaning of principles of the basics of veterinary medicine.	Animal Biotechnology	

B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Animal Biotechnology	BZh 3217	BS	Elective subjects	3.0	Bachelor	Microbiology and biotechnology	3	2	Animal Morphology, Animal Physiology, The fundamentals of Veterinary science	Production technology of animal husbandry products	Current status, problems and practical achievements of animal biotechnology. Biotechnology of animal reproduction. Superovulation. Insemination technique. Surgical and non-surgical methods of embryo transfer. Laparotomy method. Cultural environment. Evaluation, selection of gametes and embryos. Biotechnology of animal cells. Methods cultivation of gametes and embryos. Virification. Cryopreservation ECO. Embryo engineering. Molecular biotechnology. Cloned animals. Chimeric animals. Transgenic animals.	To apply theoretical and practical knowledge of animal fertilization; to demonstrate knowledge and understanding in identifying signs of pregnancy; to have training skills in the diagnosis, prevention, treatment and elimination of animal diseases of various etiologies; to understand the meaning of the principles of the basics of veterinary medicine.	Obstetrics and biotechnology of reproduction
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Methods of Mathematical Modeling 2	MNM 3241	BS	Elective subjects	3.0	Bachelor	Higher mathematics	3	2	Higher mathematics 1*	Statistical analysis and data visualization	The discipline will allow students to use methods of mathematics and mathematical modeling to study various processes. The course contains the following sections: linear spaces and some other mathematical structures, isomorphism of linear spaces, linear operators, matrix similarity, matrix polynomials, diagonalization of endomorphisms, numerical methods and algorithms, correlation and regression analysis	know the basic concepts of economic theory; knowledge of the main events in the history of the development of livestock farming, such as the consumption of livestock products per capita, master the method of analyzing economic phenomena and processes, modern methods of mathematical statistics; collect and process statistical data; know the basics of production management in the management system of livestock organizations.	Mathematical Methods in Biology 2
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Mathematical Methods in Biology 2	MNB 3243	BS	Elective subjects	3.0	Bachelor	Biology, Plant Protection and quarantine	3	2	Higher Mathematics* 1	Statistical analysis and data visualization	The discipline will allow students to use mathematical methods to study various processes. The course contains the following sections: statistical testing of hypotheses, regression analysis, correlation analysis, analysis of variance, nonparametric methods of analysis between quantitative and qualitative variables, numerical methods and algorithms.	know the basic concepts of economic theory; knowledge of the main events in the history of the development of livestock farming, such as the consumption of livestock products per capita, master the method of analyzing economic phenomena and processes, modern methods of mathematical statistics; collect and process statistical data; know the basics of production management in the management system of livestock organizations.	Methods of Mathematical Modeling 2
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Production management	PM 3220	BS	Elective subjects	3.0	Bachelor	Management and marketing	3	2	Basics of economics and law	Cattle breeding technology of milk and beef production, Commodity and expertise of animal raw materials, Horse breeding, production technology of horse meat and cumis, Sheep breeding, technology of wool, mutton production	possess a culture of thinking, generalization and analysis of information; methods of making strategic, tactical and operational decisions in the management of operational (production) activities of organizations; principles of production management and personnel management. Formation of knowledge in the field of production management at the enterprise, to reveal the main trends in improving production management in a market economy, to develop skills of independent creative work on the rationalization of processes and methods of production management.	To study the basic concepts of the laws of engineering mechanics, mechanics of materials, robotics and safety measures. To organize the production process, operation of MTP and maintenance of modern agricultural machinery with the introduction of innovative technologies and with the creation of business entities. To make an economic assessment of the main production resources on the basis of a critical assessment of the forms and methods of modern management and regulatory legal documents, procedures for creating small and medium-sized businesses in agriculture, in the field of animal husbandry and agrotechnical services	Business activities
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Business activities	PD 3220	BS	Elective subjects	3.0	Bachelor	Technology of production of products of stock-raising	3	2	Basics of economics and law	Cattle breeding technology of milk and beef production, Commodity and expertise of animal raw materials, Horse breeding, production technology of horse meat and cumis, Sheep breeding	Navigate in the normative documents regulating entrepreneurial activity, in legal and legal information, extracting everything necessary and useful for their activities.	Production management	


B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years)	Primary processing technology of animal origin raw materials	TPPOS ZHP 3313	AS	Elective subjects	4.0	Bachelor	Technology of production of products of stock-raising	3	2	Animal Morphology, Mechanization of livestock production, Zoohygiene the basics of designing livestock facilities	Pregraduation practice	Course studies the technology of primary processing of animal raw materials; the technological process of cattle slaughter and cutting of carcasses, primary processing of raw materials, supplying cattle for processing, immobilizing and raising animals on the path of exsanguination, collecting blood, rimming-over, skinning, refrigeration of meat and meat products.	To understand the importance of the principles of operation of machines and equipment for the primary processing of raw materials of animal origin; to demonstrate knowledge and understanding of complex mechanization of production processes, such as milking cows and primary processing of milk and meat; to carry out a sanitary and hygienic assessment of various methods of removal, storage and disinfection of manure.	Technology of processing animal raw materials
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years)	Technology of processing animal raw materials	TPZHS 3313	AS	Elective subjects	4.0	Bachelor	Technology of production of products of stock-raising	3	2	Animal Morphology, Mechanization of livestock production, Zoohygiene the basics of designing livestock facilities	Pregraduation practice	During the course, students study the general issues of commodity of animal raw materials, valuable consumer properties of products (woolen, leather, fur, sheepskin coat, fur and additional types of raw materials); the resources increase ways for obtaining raw materials and ways to improve their quality.	To understand the importance of the principles of operation of machines and equipment for the primary processing of raw materials of animal origin; to demonstrate knowledge and understanding of complex mechanization of production processes, such as milking cows and primary processing of milk and meat; to carry out a sanitary and hygienic assessment of various methods of removal, storage and disinfection of manure.	Primary processing technology of animal origin raw materials
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years)	Technical regulation of animal husbandry products	TRPZH 3312	AS	Elective subjects	4.0	Bachelor	Technology of production of products of stock-raising	3	2	Analytical and physical and colloid chemistry, Animal Morphology, Inorganic and organic chemistry	Commodity and expertise of animal raw materials, Internship, Pregraduation practice, Primary processing technology of animal origin raw materials, Processing and storage technology	Discipline allows you to study the regulatory documents and research methods for various types of products; product standards, documenting, trends of technical regulation of livestock products, order and implementation of the rules of technical regulation; the degree of technical regulation.	to know the basic concepts of economic theory, knowledge of the main events in the history of animal husbandry, as the consumption of livestock products per capita; to own the method of analysis of economic phenomena and processes, modern methods of mathematical statistics, to collect and process statistical data; to know the basics of production management in the management of livestock organizations;	Livestock food safety system based on HACCP principles
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years)	Livestock food safety system based on HACCP principles	SBPP ZIOP N 3312	AS	Elective subjects	4.0	Bachelor	Technology of production of products of stock-raising	3	2	Analytical and physical and colloid chemistry, Animal Morphology, Inorganic and organic chemistry	Commodity and expertise of animal raw materials, Pregraduation practice, Primary processing technology of animal origin raw materials, Processing and storage technology	The course provides for the study of forms and methods of managing the quality and safety of livestock products, the history of the development of product safety systems, the contribution of scientists to the development of quality management systems, HACCP principles, basic terms and definitions, the life cycle of livestock products, students master the process approach in the development of product quality, documentation processes and documentation requirements for the livestock product safety system.	to know the basic concepts of economic theory, knowledge of the main events in the history of animal husbandry, as the consumption of livestock products per capita; to own the method of analysis of economic phenomena and processes, modern methods of mathematical statistics; to collect and process statistical data; to know the basics of production management in the management of livestock organizations;	Technical regulation of animal husbandry products
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years)	Bee keeping	Pebe 4308	AS	Elective subjects	3.0	Bachelor	Technology of production of products of stock-raising	4	1	Animal Morphology, Animal Physiology	Internship, Pregraduation practice	The course allows you to study the biological features of bees and their structure, the composition of bee family and its structure, feeding and breeding of bees, breeds of bees, diseases and pests of bees; pollination of agricultural plants, breeding of bees household farms, organization of beekeeping.	To apply theoretical and practical knowledge of the biology of the bee family; to apply knowledge and understanding of the role and importance of the beekeeping industry in the agro-industrial complex; to demonstrate knowledge and understanding on the analysis of the situation and the application of technological methods for obtaining beekeeping products.	Pisciculture
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years)	Pisciculture	Ryb 4308	AS	Elective subjects	3.0	Bachelor	Охотоведение и рыбное хозяйство	4	1	Animal Morphology, Animal Physiology	Internship, Pregraduation practice	Discipline studies the biological characteristics of fish grown in fish farms. Ecological groups of fish. Growth and development of fish. Factors affecting the livelihoods of fish. Types and forms of fisheries. Fish breeding technology. Fertilizer ponds. Organization of feeding fish.	To know the issues of conservation of biology of wild animals and birds, their ethological features and biotopes, biological diversity of the Republic of Kazakhstan, strategies, action plans and measures for the conservation and balanced use of biological diversity. The purpose and objectives of nature parks, nature reserves, nature reserves. To know and apply laws, legislative acts in order to preserve and increase the biological diversity of natural territories of Kazakhstan. To know the issues of diagnosis	Bee keeping

B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years)	Processing and storage technology of milk and meat I	TPH MM 4318	AS	Elective subjects	3.0	Bachelor	Technology of production of products of stock-raising	4	1	Animal Morphology, Animal Physiology, Cattle breeding, technology of milk and beef production	Pregraduation practice	The discipline studies the state and prospects for the development of the dairy industry, the composition and properties of milk from various farm animals, the requirements for harvested milk, the requirements for the preparation, transport and delivery of milk; standardization of milk and dairy products; primary processing of milk; resource- and energy-saving technologies for milk processing; sanitary processing of technological equipment.	Understand the importance of the principles of operation of machines and equipment for the primary processing of raw materials of animal origin; demonstrate knowledge and understanding of complex mechanization of production processes such as milking cows and primary processing of milk and meat; carry out sanitary and hygienic assessment of various methods of removal, storage and disinfection of manure.	Farm animals slaughter technology I
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years)	Farm animals slaughter technology I	TZS 4320	AS	Elective subjects	3.0	Bachelor	Technology of production of products of stock-raising	4	1	Animal Morphology, Animal Physiology, Cattle breeding, technology of milk and beef production	Pregraduation practice	Understand the importance of the principles of operation of machines and equipment for the primary processing of raw materials of animal origin; demonstrate knowledge and understanding of complex mechanization of production processes such as milking cows and primary processing of milk and meat; carry out sanitary and hygienic assessment of various methods of removal, storage and disinfection of manure.	Processing and storage technology of milk and meat I	
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Commodity and expertise of animal raw materials	TEZh S 4315	AS	Elective subjects	3.0	Bachelor	Technology of production of products of stock-raising	4	1	Animal Morphology, Animal Physiology	Camel breeding, production technology of shubat, meat and wool; Cattle breeding, technology of milk and beef production; Goat breeding, production technology of milk, meat, wool and emmure, horse breeding, production technology of horse meat and emmure; Poultry, technology of poultry products; Sheep breeding, technology of wool, mutton production	To understand the importance of the principles of operation of machines and equipment for the primary processing of raw materials of animal origin, to demonstrate knowledge and understanding of complex mechanization of production processes, such as milking cows and primary processing of milk and meat; to carry out a sanitary and hygienic assessment of various methods of removal, storage and disinfection of manure. To understand the importance of additional livestock industries; to demonstrate knowledge and understanding of the development of the industry, the state and prospects for the development of the industry in areas; to collect information on the assessment of technological, productive indicators of additional livestock sectors.	Commodity and expertise of dairy and meat products	
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Commodity and expertise of dairy and meat products	TEM MP 4315	AS	Elective subjects	3.0	Bachelor	Technology of production of products of stock-raising	4	1	Animal Morphology, Animal Physiology	Camel breeding, production technology of shubat, meat and wool; Cattle breeding, technology of milk and beef production; Goat breeding, production technology of milk, meat, wool and emmure, horse breeding, production technology of horse meat and emmure; Poultry, technology of poultry products; Sheep breeding, technology of wool, mutton production	To understand the importance of the principles of operation of machines and equipment for the primary processing of raw materials of animal origin, to demonstrate knowledge and understanding of complex mechanization of production processes, such as milking cows and primary processing of milk and meat; to carry out a sanitary and hygienic assessment of various methods of removal, storage and disinfection of manure. To understand the importance of additional livestock industries; to demonstrate knowledge and understanding of the development of the industry, the state and prospects for the development of the industry in areas; to collect information on the assessment of technological, productive indicators of additional livestock sectors.	Commodity and expertise of animal raw materials	
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Camel breeding, production technology of shubat, meat and wool	VTPS HMS H 4309	AS	Elective subjects	3.0	Bachelor	Technology of production of products of stock-raising	4	2	Animal Morphology, Breeding and selection of agricultural animals, Feeding of agricultural animals	Pregraduation practice	To apply knowledge and understanding of the facts of the biological characteristics of various types of cattle and small ruminants; to have learning skills to characterize the origin, breeds of animals, their productive and technological properties, to demonstrate knowledge and understanding of livestock production, the use of modern technologies in selection and breeding work with large and small cattle, to know the basic concepts of economic theory, knowledge of the main events in the history of animal husbandry, as the consumption of livestock products per capitar, to own the method of analysis of economic phenomena and processes, modern methods of mathematical statistics; to collect and process statistical data; to know the basics of production management in the management of livestock organizations;	Technology of production of camel products	

B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Technology of camel products	TPPV 4309	AS	Elective subjects	3.0	Bachelor	Technology of production of products of stock-raising	4	2	Animal Morphology, Breeding and selection of agricultural animals, Feeding of agricultural animals	Pregraduation practice	Students study the origin, biological characteristics, species, breeds of camels, reproduction and rearing, feeding and maintenance of camels, master the technology for the production of camel products, the breeding value of camels and its role in the production of camel products, the technology for the production of shubat, meat and wool in camel breeding.	To apply knowledge and understanding of the facts of the biological characteristics of various types of cattle and small ruminants; to have learning skills to characterize the origin, breeds of animals, their productive and technological properties, to demonstrate knowledge and understanding of livestock production, the use of modern technologies in selection and breeding work with large and small cattle. To know the basic concepts of economic theory, knowledge of the main events in the history of animal husbandry, as the consumption of livestock products per capita; to own the method of analysis of economic phenomena and processes, modern methods of mathematical statistics; to collect and process statistical data; to know the basics of production management in the management of livestock organizations;	Camel breeding, production technology of shubat, meat and wool
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Sport horse breeding	SK 4311	AS	Elective subjects	3.0	Bachelor	Technology of production of products of stock-raising	4	2	Animal Morphology, Animal Physiology, Breeding and selection of agricultural animals, Feeding of agricultural animals	Pregraduation practice	Discipline studies the breeds of sport horses, selection of horses by origin, exterior, behavior, natural and artificial gaits, keeping, feeding and care of sport horses; students master the zooveterinarian control of sport horses, general training and preparation of sport horses, special preparation horses for competition.	To know the history, current state, prospects and objectives of the development of horse breeding; to apply learning skills when studying the breed composition, breeding, productive indicators of the horse breeding industry, to demonstrate knowledge and understanding of the development of sports horse breeding in the world and the Republic of Kazakhstan, to apply theoretical and practical knowledge on training horses for various equestrian competitions.	Equestrian tourism
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Equestrian tourism	KT 4311	AS	Elective subjects	3.0	Bachelor	Technology of production of products of stock-raising	4	2	Animal Morphology, Animal Physiology, Breeding and selection of agricultural animals, Feeding of agricultural animals	Pregraduation practice	The discipline studies the current state or sports horse breeding in Kazakhstan and the CIS, the history of the emergence of sports horse breeding, the anatomical and physiological structure of sports horses, horse breeds used in equestrian sports, types of equestrian sports (classical and national) and the rules for their conduct, reproduction in sports horse breeding. Students master the riding and group training of young horses, training and hippodrome testing of sports horses, feeding and keeping sports horses, breeding work in sports horse breeding, zootechnical and veterinary control carried out for sports horses, transportation of horses and safety when handling horses, the history of the origin of tourism, the significance and current state of equestrian tourism in Kazakhstan, the selection of horses for equestrian tourism and their use, the education and training of tourists for equestrian trips, the care of horses for equestrian tourism, the principles of tourism work and the activities of an equestrian tourism	To know the history, current state, prospects and objectives of the development of horse breeding; to apply learning skills when studying the breed composition, breeding, productive indicators of the horse breeding industry, to demonstrate knowledge and understanding of the development of sports horse breeding in the world and the Republic of Kazakhstan, to apply theoretical and practical knowledge on training horses for various equestrian competitions.	Sport horse breeding
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Goat breeding, production technology of milk, meat, wool and cashmere	KTP MMS HP 4310	AS	Elective subjects	3.0	Bachelor	Technology of production of products of stock-raising	4	2	Animal Morphology, Animal Physiology, Breeding and selection of agricultural animals, Feeding of agricultural animals	Pregraduation practice	Discipline comprise the biological features, exterior, constitution and fitness of goats, classification and characterization of the main goat breeds, products of goat breeding, reproduction of the herd and breeding of youngsters, feeding goats; economic efficiency of production of goat breeding products; breeding work in goat breeding.	To apply knowledge and understanding of the facts of the biological characteristics of various types of cattle and small ruminants; to have learning skills to characterize the origin, breeds of animals, their productive and technological properties, to demonstrate knowledge and understanding of livestock production, the use of modern technologies in selection and breeding work with large and small cattle. To know the basic concepts of economic theory, knowledge of the main events in the history of animal husbandry, as the consumption of livestock products per capita; to own the method of analysis of economic phenomena and processes, modern methods of mathematical statistics; to collect and process statistical data; to know the basics of production management in the management of livestock organizations;	Pig breeding, pork production technology

B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Pig breeding, pork production technology	STPS 4310	AS	Elective subjects	3.0	Bachelor	Technology of production of products of stock-raising	4	2	Animal Morphology, Animal Physiology, Breeding and selection of agricultural animals, Feeding of agricultural animals	Pregraduation practice	The discipline studies the technology of production of pig products, breeds of pigs, their economic and biological features, the main technical processes in pig breeding.	To apply knowledge and understanding of the facts of the biological characteristics of various types of cattle and small ruminants; to have learning skills to characterize the origin, breeds of animals, their productive and technological properties; to demonstrate knowledge and understanding of livestock production, the use of modern technologies in selection and breeding work with large and small cattle. To know the basic concepts of economic theory, knowledge of the main events in the history of animal husbandry, as the consumption of livestock products per capita; to own the method of analysis of economic phenomena and processes, modern methods of mathematical statistics; to collect and process statistical data; to know the basics of production management in the management of livestock organizations;	Goat breeding, production technology of milk, meat, wool and cashmere
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Processing and storage technology of milk and meat 2	TPH MM 4319	AS	Elective subjects	3.0	Bachelor	Technology of production of products of stock-raising	4	2	Animal Morphology, Animal Physiology, Cattle breeding technology of milk and beef production	Pregraduation practice	The discipline studies the state, prospects for the development of the meat industry, composition, properties of meat of various farm animals, requirements for meat, meat products, requirements for the preparation, transportation, delivery of slaughter animals; standardization of livestock products; meat processing, primary processing of slaughter animals, resource- and energy-saving technologies for meat processing, sanitary processing of technological equipment.	Understand the importance of the principles of operation of machines and equipment for the primary processing of raw materials of animal origin; demonstrate knowledge and understanding of complex mechanization of production processes, such as milking cows and primary processing of milk and meat; carry out sanitary and hygienic assessment of various methods of removal, storage and disinfection of manure.	Farm animals slaughter technology 2
B078 - «Animal breeding»	6B08201 - «Animal husbandry»	Full-time (bachelor 4 years) semester	Farm animals slaughter technology 2	TZS 4321	AS	Elective subjects	3.0	Bachelor	Technology of production of products of stock-raising	4	2	Animal Morphology, Animal Physiology, Cattle breeding technology of milk and beef production	Pregraduation practice	Understand the importance of the principles of operation of machines and equipment for the primary processing of raw materials of animal origin; demonstrate knowledge and understanding of complex mechanization of production processes, such as milking cows and primary processing of milk and meat; carry out sanitary and hygienic assessment of various methods of removal, storage and disinfection of manure.	Processing and storage technology of milk and meat 2	

The catalog of elective disciplines is approved by the "Veterinary and animal husbandry technology" Faculty Council, minutes № 1A of 28.08.2023

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