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**Federal State Autonomous Educational Institution of Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA**

RUDN University

Agrarian and Technological Institute

educational division - faculty/institute/academy

COURSES DESCRIPTION

36.05.01 Veterinary

field of studies / speciality code and title

Disciplines (modules) are studied as part of the development of EP HE
for the **36.05.01 Veterinary**

Course title	Fundamentals of Russian Statehood
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
What is Russia?	<p><i>The 1 module of the course:</i></p> <p><i>S</i> covers a comprehensive examination of Russia, exploring the country in its spatial, human, resource, ideological-symbolic, and normative-political dimensions, and providing objective and characteristic data about Russia's geography, resources, and economy.</p> <p><i>S</i> delves into the population, culture, religions, and languages of Russia, as well as the current situation in its regions.</p> <p><i>S</i> additionally, the course focuses on the outstanding personalities, or "heroes," and the key trials and victories that have shaped Russia's modern history.</p>
Russian state - civilization	<p><i>The 2 module of the course:</i></p> <p><i>S</i> examines the historical, geographical, and institutional foundations for the formation of Russian civilization, while also conceptualizing the notion of "civilization."</p> <p><i>S</i> delves into the question of what constitutes a civilization, exploring the advantages and disadvantages of the civilizational approach.</p> <p><i>S</i> the course highlights the distinctive features of Russia's civilizational development, including the history of its multinational (supranational) society, the transition from an imperial organization to a federal one, and the intercivilizational dialogue both within Russia and beyond its borders.</p> <p><i>S</i> additionally, the course explores the role and mission of Russia as perceived by various domestic and foreign philosophers, historians, politicians, and cultural figure.</p>
Russian worldview and values of Russian civilization	<p><i>The 3 module of the course:</i></p> <p><i>J</i> delves into the theory of worldview and related scientific concepts. It examines worldview as a functional system and presents the worldview system of Russian civilization.</p> <p><i>J</i> focuses on the key ideological positions and concepts related to Russian identity, exploring them in a historical dimension and in the context of Russian federalism.</p> <p><i>J</i> it aims to provide an independent picture of the world and the history of the unique worldview of Russian civilization, highlighting the value principles (constants) that underpin it.</p> <p><i>J</i> offers a comprehensive understanding of the foundational elements that shape the worldview and identity of Russian</p>

	civilization, drawing on perspectives from various disciplines and historical contexts.
Political structure of Russia	<p><i>The 4 module of the course:</i></p> <p>J examines the fundamentals of the constitutional system of Russia, with a focus on the principle of separation of powers and the nature of democracy in the Russian context. It delves into the features of the modern Russian political class.</p> <p>J additionally, the course explores the genealogy of leading political institutions in Russia, tracing their history and the causes and consequences of their transformation. It analyzes the various levels of power organization within the Russian Federation, as well as the significance of state projects, including their impact on key sectors, personnel, and the social sphere.</p> <p>J provides a comprehensive understanding of the political landscape and institutional dynamics that shape the Russian Federation, offering insights into the evolution and contemporary state of the country's political system.</p>
Challenges of the future and development of the country	<p><i>The 5 module of the course:</i></p> <p>J examines potential scenarios for the future development of the country and the role of the citizen in these scenarios. It explores global trends and features of world development, and how they may impact Russia.</p> <p>J additionally, the course delves into the themes of solidarity, unity, and stability within Russian society, considering the civilizational dimension and the factors that shape the country's societal cohesion.</p> <p>J aims to provide a comprehensive understanding of Russia's political, institutional, and societal dynamics, equipping learners with the knowledge to navigate and engage with the complex realities of the country's present and future trajectories.</p>

Course title	History of Russia
Course workload, CU/ac.h.	4/144
CONTENT OF THE DISCIPLINE	
Sections	Topics
I. Theory and methodology of Historical Science	1.1 History as science
II. Ancient Rus in Medieval age	2.1 Ancient Rus' 2.2 Feudal fragmentation and struggle for independence 2.3 Formation of the Russian united state
III. Russia on the brink of New Age and in the New Age	3.1 Russia in the XVI century. Ivan the Terrible 3.2 Time of Troubles and the beginning of Romanov's reign 3.3 Peter I and his age 3.4 The age of Palace coups 3.5 The Russian Empire in the second half of the XVIII century 3.6 Russia in the first quarter of the XIX century. Paul I.

	<p>Alexander I. Patriotic war of 1812</p> <p>3.7 Decembrists movement. Reign of Nicholas I</p> <p>3.8 Alexander II and the era of reforms</p> <p>3.9 Russian Empire during the reign of Alexander III</p> <p>3.10 Features of the development of capitalism in Russia (the last quarter of the XIX century.)</p>
IV. Russia and USSR in contemporary times	<p>4.1 Russian Empire in the beginning of XX cent. Nicholas II.</p> <p>4.2 Revolutions in Russia</p> <p>4.3 Domestic policy of Soviet Russia and the USSR in the prewar period</p> <p>4.4 The USSR during the great Patriotic war (1941-1945)</p> <p>4.5 Postwar years. The beginning of Khrushchev's rule.</p> <p>4.6 Thaw as a special stage of development of the USSR.</p> <p>4.7 USSR under L. Brezhnev</p> <p>4.8 USSR in 1985-1991. Perestroika.</p> <p>4.9 Collapse of the USSR and the creation of CIS</p> <p>4.10 Formation of modern Russia. Vladimir Putin.</p> <p>4.11 The role of RUDN as a "soft power" in the international relations</p>

Course title	Philosophy
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Module 1. The Nature of Philosophical Knowledge	Topic 1.1. Philosophy in the world of spiritual culture
	Topic 1.2. Philosophy and worldview
	Topic 1.3. Philosophical picture of the world.
Module 2. Historical types of philosophy	Topic 2.1. Ancient philosophy
	Topic 2.2. Philosophy of the Middle Ages, Renaissance and Modern Times
	Topic 2.3. Philosophy of Enlightenment, German classical philosophy, Modern philosophy.
Module 3. Man and Society	Topic 3.1. Philosophical models of society and social development
	Topic 3.2. Philosophical theories of justice
	Topic 3.3. Modern ethical theories. Axiology as a philosophical doctrine of values

Course title	Basic Military Training. Life Safety
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1 Life safety.	Topic 1.1 Fundamentals of human life safety: essence and content
	Topic 1.2 Fire safety

	Topic 1.3 Anti-terrorism security
	Topic 1.4. Anti-corruption and prevention of corruption risks
	Topic 1.5. Healthy lifestyle
	Topic 1.6. Personal information security
	Topic 1.7. Human life safety in emergency situations
	Topic 1.8. Civil defense as a system of nationwide measures to protect the population from dangers
	Topic 1.9. Basics of labor protection
Section 2 Basic Military Training. Life Safety	Topic 2.1. Radiation, chemical and biological protection
	Topic 2.2. Fundamentals of tactics of combined arms units
	Topic 2.3. Fire training
	Topic 2.4. Fundamentals of engineering support and communication organization
	Topic 2.5. Drill
	Topic 2.6. General military regulations of the RF Armed Forces
	Topic 2.7. Legal basis for state defense
	Topic 2.8. Military-political training
	Topic 2.9. First aid with elements of tactical medicine
	Topic 2.10. Military topography. Unmanned aerial vehicles

Course title	Physical education
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Methodological and Practical	Topic 1.1. Self-monitoring of those engaged in physical exercises and sports.
	Topic 1.2. Indicators of physical development.
	Topic 1.3. Indicators of functional state.
	Topic 1.4. Indicators of physical fitness.
	Topic 1.5. Physical performance indicators.
	Topic 1.6. Indicators of psychophysiological state.
	Theme 1.7 Physical training in the production activities of a bachelor and a specialist.
Section 2. Theoretical	Topic 2.1. Physical education in the general cultural and professional training of students.
	Topic 2.2. Socio-biological foundations of physical culture.
	Theme 2.3 The basics of a healthy lifestyle of the student. Physical education in the provision of health.
	Topic 2.4. Psychophysiological bases of educational work and intellectual activity. Means of physical culture in the regulation of performance capacity.
	Topic 2.5. Pedagogical foundations of physical education. Professional and applied physical education of students and physical culture in the professional activity of a future specialist.
	Topic 2.6 Fundamentals of general and special physical

	training. Sports training. Individual choice of sports or system of physical exercises.
	Topic 2.7. Fundamentals of the methodology of independent exercise.
	Topic 2.8. Self-monitoring of those engaged in physical exercises and sports.

Course title	Animal anatomy
Course workload, CU/ac.h.	14/504
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Introduction	Topic 1.1. Discipline is a system of knowledge about the internal and external structure of the body.
Section 2. Bone system or skeleton (osteology)	Topic 2.1. Characteristics of the skeleton, the principles of its division into departments. The role of the skeleton in the vital activity of the body.
	Topic 2.2. Axial skeleton.
	Topic 2.3. The skeleton of the head. - The facial part of the skull. - The cerebral part of the skull.
	Topic 2.4. Musculoskeletal system. - Thoracic limbs and their girdle. - Pelvic limbs and their girdle.
	Topic 2.5. Bone connection (arthrosyndesmology) - Morphofunctional characteristics of bone junctions, their classification and morphogenesis.
Section 3. Muscular system (myology)	Topic 3.1. Muscle as an organ, morphogenesis of the muscular system.
	Topic 3.2. Classification of muscles. - By origin, form, internal architectonics, function, topographical feature.
	Topic 3.3. Muscles of the axial skeleton. - Filo- and ontogenesis of the muscles of the axial department. Muscles and fascia of the neck, trunk and tail.
	Topic 3.4. Muscles of the shoulder girdle and spinal column. - Dorsal muscles of the shoulder girdle and vertebral column. Ventral muscles of the neck, lower back, tail.
	Topic 3.5. Chest muscles. - Inhaler muscles, exhalator muscles and diaphragm.
	Topic 3.6. Abdominal wall muscles.
	Topic 3.7. Head muscles. - Philo- and ontogenesis. Facial and masticatory muscles. Muscles of the sublingual apparatus.
	Topic 3.8. Limb muscles. - Philo and ontogenesis.

	<p>Topic 3.9. Muscles of the thoracic limb. The muscles of the shoulder joint, elbow joint, wrist joint, finger joints and short finger muscles.</p>
	<p>Topic 3.10. Pelvic limb muscles. - The muscles of the hip joint, knee joint and the metatarsal joint.</p>
	<p>Topic 3.11. Muscles of the finger joints.</p>
Section 4. General (skin) cover.	<p>Topic 4.1. General morphofunctional characteristics of the skin and its derivatives.</p>
Section 5. Nervous system (neurology).	<p>Topic 5.1. Morphofunctional characteristics, anatomical composition and structural elements, the principle of the nervous system.</p>
	<p>Topic 5.2. The central part of the nervous system. - Structure and development of the central nervous system. The structure of the spinal cord and brain, functional characteristics. Conductor apparatus</p>
	<p>Topic 5.3. Peripheral part of the nervous system. Morphofunctional characteristics of cranial and spinal nerves. General and species-specific signs of structure, branching and location.</p>
	<p>Topic 5.4. The autonomic part of the nervous system. - Anatomical, functional and topographic characteristics. Regularities of the structure, formation and distribution of sympathetic, para- and metasympathetic nervous structures.</p>
Section 6. Analyzers.	<p>Topic 6.1. Classification, anatomical structure and morphofunctional characteristics of analyzers. The study of the phylogeny and ontogenesis of analyzers. General data on intero-, proprio- and exteroceptors.</p>
Section 7. The endocrine system.	<p>Topic 7.1. Morphofunctional characteristics and anatomical composition of the endocrine apparatus. Morphogenetic, topographic and functional characteristics of the glands of internal and mixed secretion. Specific and age-related features of the structure and location of the glands.</p>
Section 8. Cardiovascular system.	<p>Topic 8.1. Anatomical composition, morphogenesis and structural and functional characteristics of the cardiovascular system and its relationship with other body systems.</p>
	<p>Topic 8.2. Circulatory system. - Structure, development, species and age characteristics. Specific features, basic patterns of the structure, branching and location of blood vessels. Circulatory circles.</p>
	<p>Topic 8.3. Lymphatic system. - General morphofunctional characteristics and anatomical composition of the system. Its development. General patterns and specific features of the location of the lymphatic system.</p>

	<p>Topic 8.4. organs of hemo- and immunopoiesis. Morphofunctional characteristics, anatomical composition and classification of organs. The structure, location and specific features of hematopoietic organs and organs of the immune system.</p>
<p>Section 9. Splanchnology.</p>	<p>Topic 9.1. Morphofunctional characteristics of internal organs, their classification, features of structure and development. Body cavities, their development, serous integuments and their derivatives. The relationship of internal organs with other body systems and the external environment.</p>
	<p>Topic 9.2. Digestive system. - Anatomical composition of the apparatus, division into departments, classification of glands. Species and age features. Anatomical and topographic features of the digestive apparatus in the X-ray image.</p>
	<p>Topic 9.2.1. Head department (oral cavity and pharynx). - Specific and functional features of the structure of the organs of the vestibule of the mouth. Glandular apparatus of the head intestine.</p>
	<p>Topic 9.2.2. Anterior section (esophageal-gastric) - Structure, topography, species and age features. Morphogenesis of the stomach and omentum. Classification of stomachs. Structure and functions of the mesh gutter in ruminants.</p>
	<p>Topic 9.2.3. Middle section (small intestine) - Structure, topography, species and age features. Morphogenesis of the stomach and omentum. Classification of stomachs. Structure and functions of the mesh gutter in ruminants.</p>
	<p>Topic 9.2.4. Posterior section (large intestine). - Anatomical and topographic characteristics of the structure, morphogenesis, species and age features, functional purpose.</p>
	<p>Topic 9.3. Breathing apparatus. - General structure, morphogenesis of respiratory organs in connection with other body systems and the external environment. Anatomical features of the respiratory organs in the X-ray image.</p>
	<p>Topic 9.4. The urinary apparatus. - Morphogenetic relationship and functional difference of organs of urination and reproduction. Morphofunctional characteristics of the device. X-ray-anatomy of the genitourinary apparatus.</p>

	<p>Topic 9.4.1. Urinary organs.</p> <p>- Anatomical composition of the urinary system, the structure of the kidneys and urinary tract, their connection with other body systems. Species, age and topographical features of urinary organs.</p>
	<p>Topic 9.4.2. Organs of reproduction.</p> <p>- Anatomical composition and structure of reproductive organs. Species, age and topographical features of the genitals and the causes of their appearance.</p>
Section 10. Features of the anatomy of domestic birds.	Topic 10.1. Analysis of the structure of organs and systems of various types of domestic birds related to flight, nutrition and industrial maintenance.

Course title	Latin language
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1: Phonetics	Topic 1.1. The Latin alphabet. Letters and sounds. Vowels and consonants. Diphthongs and digraphs. Pronunciation and reading rules. Syllabic division and syllable count. Rules for accentuation. Features of Latin and Greek orthography.
Раздел 2. Анатомо-гистологическая терминология	Topic 2.1. Nouns. The system of declension. Grammatical categories. Vocabulary form. Singular definition. Nominative and genitive cases of the singular.
	Topic 2.2. Axial skeleton. The adjective name. Grammatical categories. Vocabulary form. Two groups of adjectives. Consonant adjectives with nouns. Consonant definition.
	Topic 2.3. The structure of anatomical terms. Degrees of comparison of adjectives. Comparative degree. Superlative. Use in anatomical terminology. Substantiation. Compound adjectives. Anatomical term with consonant and inconsonant definition.
	Topic 2.4. III declension. The concept of equal and unequal declension. Types of the third declension. Genitive endings of masculine, feminine and neuter nouns of the third declension. Names of muscles according to their function.
	Topic 2.5. Nouns IV - V declensions. Basic case endings and peculiarities.
	Topic 2.6. The plural of nouns and adjectives.
	Topic 2.7. A plural anatomical term that includes the plural. Exceptions.
Section 3: Clinical Terminology	Topic 3.1. Word formation in anatomical and histological terminology. The most used prefixes and suffixes.
	Topic 3.2. Introduction to clinical terminology. Some general concepts of terminological word formation. A

	<p>general introduction to clinical terms. Greek-Latin doublets and single term elements.</p> <p>Topic 3.3. Greek-Latin doublets for organs, body parts, tissues. Greek terms denoting doctrine, science, method of diagnostic examination, treatment, suffering, disease.</p> <p>1. The notion of a finite term-element. The Greek term elements denoting pathological changes of organs and tissues, therapeutic and surgical techniques.</p> <p>Topic 3.4. Greek-Latin doublet designations of tissues, organs, secretions, secretions, sex, age. Types of non-surgical and surgical treatment. Single term-elements denoting functional and pathological conditions and processes. Term-elements-equivalents.</p> <p>Topic 3.5. Greek-Latin doublets denoting various physical properties, qualities, relations and other attributes.</p> <p>Topic 3.6. Pathology of the oral cavity: basic terms and the way they are formed.</p>
Section 4: Pharmaceutical Terminology. Prescription (on the STEPIK online platform)	<p>Topic 4.1. The concept of a medicinal substance, drug, dosage form. Methods of formation of a pharmaceutical term.</p> <p>Topic 4.2. Verb. Vocabulary form. The imperative and subjunctive inclinations.</p> <p>Topic 4.3. The structure of the prescription. Formation of the Latin part of the prescription. Prescription formulations in Latin and how to translate them into Russian. Verbal expressions in recipes. Expressions with prepositions.</p> <p>Topic 4.4 Chemical nomenclature. Oxides and acids.</p> <p>Topic 4.5. Names of salts in pharmaceutical terminology. Ethers. Potassium-sodium salts.</p> <p>Topic 4.6. The most important prescription abbreviations.</p>

Course title	Inorganic and analytical chemistry
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Structure of the atom. Chemical bonding	Topic 1.1 Electronic configurations of atoms and ions.
	Theme 1.2 The periodic law of D.I. Mendeleev.
	Topic 1.3 The method of valence bonds.
	Topic 1.4 Valence.
	Topic 1.5 Hybridization of orbitals.
	Topic 1.6 Chemical bonding in complex compounds.
Section 2. Thermochemistry.	Topic 2.1 Fundamentals of thermochemistry.

Chemical equilibrium.	Topic 2.2 Enthalpy.
	Topic 2.3 Hess's Law.
	Topic 2.4 Entropy.
	Topic 2.5 Gibbs free energy.
	Topic 2.6 Chemical equilibrium.
	Topic 2.7 Law of Action of Masses.
	Topic 2.8 Chemical equilibrium displacement.
Section 3. Solutions. Electrolytic dissociation	Topic 3.1 General concepts of disperse systems.
	Topic 3.2 Ways to express the concentration of solutions: mass fraction, molar concentration, molar concentration of equivalent substances.
	Topic 3.3 The theory of electrolytic dissociation.
Section 4. Dissociation of weak and strong electrolytes. Hydrolysis of salts	Topic 4.1 Weak electrolytes.
	Topic 4.2 The law of dilution.
	Topic 4.3 . The common ion effect.
	Topic 4.4 Buffer solutions.
	Topic 4.5 Strong electrolytes.
	Topic 4.6 Activity and activity coefficient.
	Topic 4.7 Ionic force.
	Topic 4.8 Ionic product of water.
	Topic 4.9 Hydrogen Index.
	Topic 4.10 Hydrolysis of salts.
	Topic 4.11 Dependence of hydrolysis on temperature and solution concentration.
Section 5. Heterogeneous equilibria. Coordination compounds.	Topic 5.1 Solubility constant.
	Topic 5.2 Solubility.
	Topic 5.3 Dissolution and precipitation conditions.
	Topic 5.4 Electrolytic dissociation and the instability constant of coordination compounds.
Section 6. Redox Reactions	Topic 6.1 Oxidation-reduction reactions.
	Topic 6.2 Redox potentials.
	Topic 6.3 Nernst equation.
	Topic 6.4 Conditioning of redox reactions.

Section 7. Basic Classes of Inorganic Compounds	Topic 7.1 Main classes of inorganic compounds.
	Topic 7.2 Relationship of inorganic compounds.
Section 8. Basics of Qualitative Analysis	Topic 8.1 Fundamentals of qualitative analysis of cations and anions.
	Topic 8.2 Determination of cations of analytical groups I - VI and anions of analytical groups I - III in solutions.
Section 9. Basics of Quantitative Analysis	Topic 9.1 Fundamentals of Quantitative Analysis.
	Topic 9.2 Methods of neutralization, complexometry, oxidimetry and photocolorimetry.

Course title	Organic Chemistry
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Module 1. Introduction	<p>Topic 1.1. The subject of organic chemistry. Carbon compounds, their characteristics, natural sources of organic compounds. The importance of organic chemistry as a tool of knowledge of man's technogenic influence on the environment. Brief sketch of the history of organic chemistry.</p> <p>The theory of structure of organic compounds (Butlerov A.M.), the present state of the theory of chemical structure. Principles of nomenclature of organic compounds. Nomenclature of UPAC. Classification of organic compounds. Rows, classes, functional groups.</p> <p>Basic principles of qualitative and quantitative analysis, methods of establishing the structure of organic compounds.</p>
Module 2. Hydrocarbons.	<p>Topic 2.1. Alkanes. Homological series. Nomenclature, isomerism, methods of preparation of alkanes. Physical properties. Chemical properties. Identification of alkanes.</p>
	<p>Topic 2.2. Alkenes. Homological series, nomenclature. Isomerism. Methods for obtaining alkenes. Physical properties. Chemical properties: electrophilic mechanism of addition to alkenes. Markovnikov's rule. Radical addition in the presence of peroxides (Harash). Identification of alkenes.</p>
	<p>Topic 2.3 Alkynes. Homological series, nomenclature. Methods for preparation of alkynes. Physical properties. Chemical properties. Adhesion reactions. Dimerization of acetylene. Reactions of acetylene hydrogen atom: formation of acetylenides. Identification of alkynes.</p>
	<p>Topic 2.4. Diene hydrocarbons. Homological series, classification and nomenclature. Electronic structure of conjugated double bond system. Methods of preparation of divinyl, isoprene and chloroprene. Chemical properties of conjugated dienes: reactions of addition to 1,2- and 1,4-positions; polymerization reactions. Rubber (NK, SK) and</p>

	plastics. Identification of dienes.
Module 3: Aromatic hydrocarbons and homofunctional compounds.	Module 3.1. Aromatic hydrocarbons (arenes). Homological series, nomenclature and isomerization of benzene hydrocarbons. Electronic structure of the benzene molecule. Aromaticity, Hückel rule. Methods for obtaining arenes, their physical properties. Chemical properties: electrophilic substitution of hydrogen in the benzene nucleus. Mechanism of reaction. Orientation rules for electrophilic substitution: ortho- and meta-orientants and their influence on subsequent substitution in the benzene core. Condensed aromatic systems. Methods for the identification of arenes.
	Module 3.2. Halogen derivatives. Nucleophilic substitution reactions of halogen in halide alkyls and arynes. SN1 and SN2 - Mechanisms of substitution. Elimination reactions. Zaitsev's rule. Organometallic compounds. Comparison of chemical activity of halogen bound to carbon of benzene ring with carbon of side cycle. Identification of halogen derivatives of HC.
	Module 3.3. Alcohols. Classification, nomenclature and isomerism. Methods for the production of alcohols. Physical properties, hydrogen bonds. Chemical properties of monatomic alcohols. Simple esters. Preparation, properties and applications. Bi-atomic alcohols (glycols). Preparation, chemical properties, applications. Three-atom alcohols (glycerols). Natural sources and chemical methods of production. Properties and applications of glycerol. Phenols. Nomenclature and isomerization. Methods of production. Physical properties. Electronic structure of phenol molecule. Influence of substituents in benzene ring on acid properties of phenols. Chemical properties of phenols. Electrophilic substitution reactions in the benzene ring of phenols. Phenol-formaldehyde resins. Identification of alcohols and phenols.
	Module 3.4. Amines. Classification, nomenclature, isomerism. Methods for preparation of amines. Physical properties. Chemical properties salt formation, alkylation, acylation, action of nitric acid on amines. Aromatic amines. Aniline, methods of its preparation. Substitution reactions of aromatic amines in the nucleus and reactions by amino group. Comparison of basic properties of fatty and aromatic amines. Identification of amines.
	Module 3.5. Aldehydes and ketones. Isomerism and nomenclature. Methods of production. Structure of the carbonyl group. Physical properties. Chemical properties: reactions of nucleophilic addition to carbonyl group. Substitution reactions of carbonyl oxygen. Haloform reaction. Reaction of formation of acetals (catalysts). Reactions involving hydrogen in the α -position to the carbonyl group. Aldole and croton condensations. Reduction and oxidation of aldehydes and ketones. Identification of oxo compounds.
Module 4. Carboxylic Acids and	Module 4.1. Carboxylic acids. Isomerism and nomenclature.

Heterofunctional Compounds	Structure of the carboxylic group. Influence of the structure of carboxylic acids on their acidic properties. Methods for production. Physical properties. Chemical properties: reactions by carboxylic group and by α -position to carboxylic group. Derivatives of carboxylic acids: halogenanhydrides, anhydrides, nitriles, amides, esters.
	Module 4.2. Lipids. Natural fats and oils - glycerides of higher fatty acids. Hydrolysis of fats, soaps. Hydrogenation of fats, margarine.
	Module 4.3. Non-saturated carboxylic acids. Methods of production and chemical transformations. Acrylic and methacrylic acids, methods of their production, synthetic materials based on polymers of these acids.
	Module 4.4. Bivalent carboxylic acids, methods of their production, properties and applications. Unsaturated bivalent acids.
	Module 4.5. Oxic acids. Basicity and atomicity. Methods of preparation. General and specific properties of oxyacids. Salicylic acid. Relation of α -, β - and γ -oxy acids to heating.
	Module 4.6. Oxo acids (aldehyde and keto acids). Nomenclature, structure and methods of production. Chemical properties.
	Module 4.7. Amino acids. Classification, nomenclature, structure and methods of production of amino acids. Isoelectric current. Chemical properties of amino acids, transformations by heating of α -, β - and γ -amino acids. Peptides.
Module 5. Carbohydrates	Module 5.1. Monosaccharides: aldoses and ketoses, isomerism, configuration. Ring-chain tautomerism of monoses. Mutarotation. Reactions of monoses by carbonyl and oxy groups.

Course title	Law Science
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Introduction to the legal theory.	1.1. Concept and characteristics of law. Law in the system of social norms. 1.2. Sources and principles of law. Legal norm (rule) and its structure. 1.3. Legal relations: concept and characteristics. Legal facts. Offense and legal liability. 1.4. Lawmaking: concept and types. Systematization of law. 1.5. System of law. National and international law. 1.6. Human rights and freedoms. Classification of human rights. Mechanisms for the protection of human rights.
Section 2. Introduction to the political theory.	2.1. Origin of the state. The concept and characteristics of the state. 2.2. Functions and mechanism of the state. 2.3. Form of state: form of government, form of state

	structure, political regime.
Section 3. Fundamentals of constitutional law.	3.1. The concept of constitutional law as a branch of law. Subject and method of constitutional law. 3.2. Sources of constitutional law. 3.3. Basic institutions of constitutional law.
Section 4. Fundamentals of administrative law.	4.1. The concept of administrative law as a branch of law. Subject and method of administrative law. 4.2. Sources of administrative law. 4.3. Basic institutions of administrative law. 4.4. The concept of administrative offense and administrative liability.
Section 5. Fundamentals of civil law.	5.1. The concept of civil law as a branch of law. Subject and method of civil law. 5.2. Sources of civil law. Principles of civil law. 5.3. Civil relations. Individuals and legal entities as subjects of civil law. Objects of civil rights. 5.4. The concept and content of rights in rem. 5.5. The concept of a civil transaction. The concept and content of a civil contract. 5.6. Terms in civil law. Limitation period. 5.7. Concept and types of obligations. Civil liability. 5.8. Basics of inheritance law.
Section 6. Fundamentals of criminal law.	6.1. The concept of criminal law as a branch of law. Subject and method of criminal law. 6.2. Sources of criminal law. The action of criminal law in time, in space and to persons 6.3. Crime: concept and general characteristics. Corpus delicti. 6.4. The concept and characteristics of criminal liability. Circumstances excluding the criminality of a deed. 6.5. Concept and types of criminal penalties.
Section 7. Fundamentals of labor law.	7.1. The concept of labor law as a branch of law. Subject and method of labor law. 7.2. Sources of labor law. 7.3. Employment contract: concept, content and types. 7.4. Working time and rest time. The concept of remuneration. 7.5. Labor discipline and work schedule. 7.6. Labor disputes: concept and types.
Section 8. Fundamentals of family law.	8.1. The concept of family law as a branch of law. Subject and method of family law. 8.2. Sources of family law. Basic institutions of family law. 8.3. Concept, signs, conditions and procedure for marriage. Nullity of marriage. Divorce. 8.4. Rights and obligations of spouses. Rights of minors. 8.5. Alimony obligations.

Course title	Biology with the Basics of Ecology
Course workload, CU/ac.h.	2/72

CONTENT OF THE DISCIPLINE	
Sections	Topics
Module 1. Invertebrate animals	Topic 1. Protozoa.
	Topic 1.2. Coelenterates.
	Topic 1.3. Flatworms.
	Topic 1.4. Roundworms.
	Topic 1.5. Ringed worms.
	Topic 1.6. Arthropods.
	Topic 1.7. Arachnids.
	Topic 1.8. Crustaceans.
	Topic 1.9. Insects.
	Topic 1.10. Shellfish.
Module 2. Vertebrate animals	Topic 2.1. Cartilaginous fish.
	Topic 2.2. Bony fish.
	Topic 2.3. Amphibians.
	Topic 2.4. Reptiles.
	Topic 2.5. Birds.
	Topic 2.6. Mammals.

Course title	Biophysics
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Module 1. Introduction	Topic 1.1. Subject of physics and biological physics. Physical quantities, units of measurement and systems of units. Elements of vector algebra and mathematical analysis. Elements of the theory of errors and processing of experimental data.
Module 2. Mechanics. Oscillations and waves.	Topic 2.1. Material point kinematics. Basic kinematic characteristics: trajectory, path, displacement vector, instantaneous and average speed, acceleration. Types of mechanical movement. Circular movement. Dynamics. Newton's laws. Types of forces in mechanics. Translational and rotational motion of a rigid body. Moment of power. Work, power, energy. Elements of biomechanics. Free fall. Orbital motion and space velocities. Weight, weightlessness and overload. Biological action of weightlessness and overload. Ballistocardiography. Conservation laws in mechanics: momentum, energy, angular momentum. Work and power of living organisms. Ergometry. Oscillatory motion. Harmonic vibrations and their characteristics. Damped and forced oscillations. Resonance. Waves. Transverse and longitudinal waves. Elements of acoustics. The nature of sound vibrations, physical and psychophysical characteristics of sound. Weber-Fechner psychophysiological law. Logarithmic units of loudness levels. Hearing ranges for humans and animals. Ultrasound and infrasound. The use of ultrasound in medicine. Influence of infrasound on living organisms.

	Doppler effect and its application in medicine.
Module 3. Hydrodynamics	Topic 3.1. Basic properties of liquids. Pressure, Pascal's law. Jet continuity equation. Bernoulli's equation. Viscosity. Viscous fluid flow. Poiseuille's formula. Laminar and turbulent flow. Elements of hemodynamics. Clinical method for determining blood viscosity. Viscometers. The circulatory system is like a branch of the tubes. Mechanical work and the power of the heart. Blood pressure.
Module 4. Molecular physics and thermodynamics	Topic 4.1. Elements of classical molecular kinetic theory (MKT). The amount of substance. Basic equation of MKT. Temperature. Ideal gas laws. Elements of thermodynamics. Internal energy of gas. Heat capacity. Adiabatic process. Real gases. Van der Waals equation. Surface tension in a liquid. Wetting and capillary phenomena. Irreversibility of real thermodynamic processes. The first and second law of thermodynamics. Entropy. Living organisms as thermodynamic systems. Entropy of biological systems.
Module 5. Electricity and magnetism	Topic 5.1. Electrical interaction and charge. Electric field and its characteristics. Conductors and dielectrics in an electrostatic field. Electric capacity. The heart is like an electric dipole. Physical foundations of electrocardiography. Direct electric current, electromotive force and voltage of the current source. Electrical resistance. Work and power of the current. Basic laws of direct current. Direct current electrical conductivity of biological tissues and fluids. The primary effect of direct current on body tissues. Galvanization. Electrophoresis of medicinal substances. Magnetic phenomena. Magnetic field characteristics. Ampere force. Magnetic field in matter. Lorentz force. The phenomenon of electromagnetic induction. Faraday's law. Self-induction. Alternating electric current. Electromagnetic waves, scale of electromagnetic waves. Biological action of high-frequency electromagnetic radiation. UHF therapy. The use of ultraviolet radiation (luminescence analysis) in veterinary and sanitary examination.
Module 6. Optics and elements of atomic physics	Topic 6.1. About the nature of light. Geometric optics. The laws of reflection and refraction of light. Thin lenses. The eye as an optical system. Sensitivity of the eye to light and color. Disadvantages of the optical system of the eye and their elimination. Dispersion of light. Light interference. Light diffraction. Light polarization. Study of biological tissues in polarized light. Quantum properties of light. Emission and absorption spectra. Photo effect. The principle of operation of optical devices. Angular and linear magnification. Microscope and its characteristics. Biological action of light. The structure of the atom, Bohr's postulates and the periodic table of elements. Features and nature of nuclear forces. The composition of the nuclei. Isotopes. Radioactivity. The law of radioactive decay.

	Mass and energy. The biological effect of radioactive radiation. Dosimetry elements. X-ray radiation and its use in medicine.
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Course title	Computer Science
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Module 1. Office365 corporate service	Topic 1.1. Service architecture, General settings, Access policies Outlook, Calendar, Users OneDrive, Teams
Module 2. Microsoft Word 2016 text editor	Topic 2.1. General settings Typing rules Page Setup Paragraph formatting Bullets, lists, and numbers Graphic Objects Tables Patch and annotations Templates Styles, Headings, Table of contents References Document Merging
Module 3. Microsoft Excel 2016 spreadsheet processor	Topic 3.1. General Information Cell format Addressing Formulas and functions Diagrams Sorting Filters Summary tables Connecting to External Sources
Module 4. Microsoft PowerPoint 2016 Presentation Preparation Software	Topic 4.1. General Information Slide options Images SmartArt Tables Animations Recommendations

Course title	Physical and Colloidal Chemistry
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Phase equilibria. Properties of solutions	Topic 1.1 Types of solutions: liquid, gas, solid. Thermodynamics of solutions. Chemical potential of a solution component. Types of solutions. Heterogeneous multicomponent systems. Gibbs phase rule. Single-component heterogeneous systems. Clapeyron-Clausius

	equation. State diagrams of water.
	Topic 1.2 Characteristics of binary systems. Number of parameters and number of phases. Equilibrium between liquid solution and vapor. Raoul's law. Deviations from Raoul's law for non-ideal liquid solutions. Liquid-vapor state diagrams for binary systems. Lever rule. Azeotropic solutions. Fractional distillation. Limited solubility of liquids. Extraction. Solubility of gases in liquids. Sechenov's law. Cryoscopy and ebullioscopy. Osmosis. Colligative properties of electrolyte solutions.
	Topic 1.3 Vant-Goff isotonic coefficient.
	Topic 1.4 Equilibria between solid phases and melts. Types of melting diagrams. Physical and chemical analysis.
	Topic 1.5 Three-component systems. The Gibbs-Rosebohm triangle. The solubility diagram of three liquids.
Section 2. Electrochemistry.	Topic 2.1 Differences between the properties of electrolyte solutions and the properties of non-electrolyte solutions. Arrhenius theory of electrolytic dissociation. Ionic equilibria in solutions. Dissociation constants. Ionic derivation of water. Hydrogen index. Buffer solutions. Reasons for the stability of ionic systems. The ionic strength of solutions.
	Theme 2.2 Electrical conductivity of electrolyte solutions. Specific, equivalent and molar conductivity of electrolyte solutions and their dependence on concentration. Kohlrausch's rule. Mobility of ions. Application of conductometry in analytical chemistry.
	Topic 2.3 Mechanism of appearance of the potential jump at the interface. Diffusion potential.
	Topic 2.4 Electrode potentials. The Nernst equation. Standard electrode potentials. Hydrogen electrode. Measurement of pH.

	Topic 2.5 Galvanic elements and electromotive force. Electrochemical and concentration elements. The Nernst equation. Calculation of the standard Gibbs energy.
Section 3. Chemical kinetics. Catalysis.	Topic 3.1 Basic definitions. Simple and complex reactions. Reaction rate. Kinetic law of acting masses. Kinetic equation, molecularity and order of reaction. Kinetics of simple zero, first and second order reactions. The half-turn period. Methods for determining the order of a reaction.
	Topic 3.2 Complex reactions: reversible, parallel, serial and conjugate.
	Topic 3.3 Influence of temperature on the reaction rate. Van Goff rule and Arrhenius equation. Determination of the shelf life of drugs and storage conditions.
	Topic 3.4 The theory of active collisions. Reaction activation energy, methods of determination. The theory of activated complex. Peculiarities of reactions in liquid solutions. Photochemical reactions.
	Topic 3.5 Catalysis. Kinetics of homogeneous catalytic reactions. Enzymatic catalysis. Michaelis-Menten equation. Inhibitors. Heterogeneous catalysis.
Section 4. Surface phenomena. Adsorption. Chromatography.	Topic 4.1 Surface tension and phenomena at the interface: adsorption, adhesion, wetting. Flotation as a method of separation of dispersed phases. Lyophobic and lyophilic surfaces. Adhesion. Dupré's equation. Wetting. The Gibbs adsorption theory. Adsorption on liquid surfaces. Surface active substances (surfactants). The Duclos-Traube rule. The Szyszkowski equation.
	Topic 4.2 Physical adsorption, chemisorption. Model theories of reversible adsorption on homogeneous surfaces. Henry and Langmuir adsorption isotherms. Ultimate adsorption, determination of specific surface area of sorbents. Heat of adsorption. Peculiarities of adsorption of molecules and ions from solutions on solid surfaces. Adsorption isotherm with exchange constant. The lyotropic series. Ionites.
	Topic 4.3 Porous materials. Enterosorbents.
	Topic 4.4 Chromatography. Types of chromatography. Qualitative and quantitative chromatographic analysis.
Section 5. Colloid chemistry. Classifications, methods of production and properties of dispersed systems.	Topic 5.1 History, major tasks and directions of development of colloidal chemistry. Classification of dispersed (colloidal) systems, their importance. The role of stabilizer.
	Topic 5.2 Conditions and methods of obtaining dispersions. Peptization.
	Topic 5.3 Micelle structure of hydrophobic sol.

	<p>Topic 5.4 Commonality of molecular and kinetic properties of solutions and disperse systems. Diffusion and Brownian motion. Fick's, Einstein's and Einstein-Smoluchowski's equations. Osmosis and membrane processes of purification of colloidal systems (dialysis, ultrafiltration).</p>
	<p>Topic 5.5 Kinetic stability of free-dispersed systems. Sedimentation. Analysis of dispersity of colloidal systems according to sedimentation and centrifugation. Suspensions. Hypsometric law.</p>
	<p>Topic 5.6 Optical properties. Scattering and absorption of light in colloidal systems. Rayleigh's law. Application of Lambert-Beyer law to turbid media. Optical methods of research of dispersions (nephelometry, turbidimetry, ultramicroscopy, electron microscopy).</p>
<p>Section 6. Electrical phenomena in dispersions. Aggregative stability. Coagulation.</p>	<p>Topic 6.1 Appearance of the double electric layer (DES) at the phase boundary. Lippmann equation. The structure of DES and its potentials DES (thermodynamic, adsorption and electrokinetic) and the influence of various factors on them. The isoelectric state.</p>
	<p>Topic 6.2 Electrokinetic phenomena (electrophoresis, electro-osmosis, sedimentation and flow potentials) and their practical significance. Electrophoresis. Helmholtz-S Moluchowski equations.</p>
	<p>Topic 6.3 Factors of kinetic and aggregative stability of disperse systems. Coagulation, electrolyte coagulation threshold (rule of significance). Deryagin-Landau-Ferwey-Overbeck /DLFO/ theory of stability of hydrophobic colloids. Potential curves. Thixotropy.</p>
	<p>Topic 6.4 Gels of hydrophobic sols. Coagulation kinetics. Special cases of coagulation of sols with electrolytes. Structural and mechanical factor of stabilization of dispersions. Colloidal protection. Protective substances, protective numbers.</p>
<p>Section 7. Lyophilic colloids. Solutions of high molecular weight compounds (HMS) and their properties.</p>	<p>Topic 7.1 General characteristics of high molecular weight compounds (HMS). Classification of high-molecular-molecular compounds. Natural and synthetic high-molecular-molecular-molecule compounds. Conformation of macromolecules.</p>
	<p>Topic 7.2 Swelling of OMC. Thermodynamics and kinetics of swelling. Resolutions of hydrophobic polymeric materials as thermodynamically equilibrium colloidal systems. Comparison of properties of solutions of HMS and hydrophobic sols. Osmotic pressure, viscosity and optical properties of the Navy solutions. Solutions of polyelectrolytes. Polyampholytes. Protein isoelectric point and methods of its determination. Gibbs-Donnan membrane equilibrium. Disturbance of stability of polymer solutions (gelation, coacervation, desalinization, denaturation).</p>

	Topic 7.3 Gels of the Navy solutions. Properties of the gels of the Navy and gels of hydrophobic sols. Syneresis of gels. Gels.
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Course title	Cytology, Histology and Embryology
Course workload, CU/ac.h.	7/252
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Cytology, embryology and general histology	Topic 1.1. Cytology
	Topic 1.2. Embryology
	Topic 1.3. Epithelial tissues
	Topic 1.4. Connective tissues
	Topic 1.5. Muscle tissue
	Topic 1.6. Nervous tissue
Section 2. Private histology	Topic 2.1. Nervous system and sensory organs
	Topic 2.2. Endocrine system
	Topic 2.3. Circulatory system and organs of hematopoiesis
	Topic 2.4. Digestive system
	Topic 2.5. Respiratory organs
	Topic 2.6. Skin and its derivatives
	Topic 2.7. The genitourinary system

Course title	Biological Chemistry
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Introducing into Biological chemistry	Topic 1.1. A subject of biological chemistry. The main stages of the development of Biological chemistry. The most important problems of modern Biological chemistry. The place of Biological chemistry among biological sciences. Using the achievements of Biological chemistry in veterinary. The main chemical components of living systems. The concept of the structure of proteins.
Section 2. Proteins: the structure, its own, functions.	Topic 2.1. Proteins are the basis of the structure and function of living organisms. Biological role of proteins. Methods for the isolation and purification of proteins. Amino acid composition of proteins. Classification of amino acids. Structure and physico-chemical properties of amino acids. Biologically active peptides. Structural and functional diversity of proteins. Physico-chemical properties of proteins. Methods of studying proteins. Levels of the structural organization of proteins. Monomers and oligomers. Folding the squirrel.

Section 3. Enzymes.	Topic 3.1. Biological catalysts: ribozymes and enzymes. Chemical structure of enzymes. The active center, its adsorption and catalytic sites. Coenzymes - the concept of their functional role and chemical diversity. Classification and nomenclature of enzymes. Enzyme activity, units of its measurement. Kinetics of enzymatic catalysis. Regulation of enzymatic activity. Enzyme inhibitors: irreversible and reversible; competitive and noncompetitive (allosteric).
Section 4. Vitamins.	Topic 4.1. Vitamins are essential factors of human and animal nutrition. Distribution of vitamins in nature. The chemical nature of vitamins, pictures of hypo - and hypervitaminosis in the body. Classification of vitamins. The concept of antivitamins. Characteristics and formulas of individual water-soluble vitamins B1, B2, pantothenic acid, PP, B6, B12, H (biotin), folic acid, C. Coenzymes - derivatives of vitamins. The functional role of coenzymes. Fat-soluble vitamins A, D, E, K. Biological role of vitamins. Specific signs of diseases of animals and birds in beriberi. The need for vitamins of different species of animals and birds.
Section 5. Hormones.	Topic 5.1. The general concept of hormones. The role of the central nervous system in the regulation of the activity of endocrine glands. Hormones are coordinators of biochemical processes. Subordination of endocrine organs. Classification of hormones chemical nature: hormones, peptide and protein nature, amino acid derivatives, steroid hormones natural prostaglandins. Methods for determining hormones. Biological role of hormones as metabolism regulators. Mechanisms of action of hormones. The use of hormones and their synthetic analogues in livestock and veterinary medicine.
Section 6. Metabolism of carbohydrates.	Topic 6.1. Biological role of carbohydrates. Classification of carbohydrates. Conversion of carbohydrate feeds in the gastrointestinal tract of farm animals, enzymes involved in the digestion of carbohydrates. The role of carbohydrates in the metabolism, the accumulation of energy. The central role of glucose in carbohydrate metabolism. Possible ways of conversion of glucose-6-phosphate. Anaerobic transformation of glucose (glycolysis). Substrate phosphorylation. Regulation and energy output of glycolysis.
Section 7. Metabolism of lipids.	Topic 7.1. Metabolism of lipids. Digestion, absorption and transport of lipids in the digestive tract of animals. Decomposition and resynthesis of triacylglycerols. Transformations of glycerol. -oxidation of fatty acids in mitochondria. Oxidation of fatty acids with an odd number of carbon atoms. Energy effect of oxidation of fatty acids. Biosynthesis of fatty acids and phospholipids in various tissues. Acetone bodies and their biological role. Molecular mechanisms of ketosis in farm animals. Biosynthesis of cholesterol. Lipoproteins of blood serum. Relationship of the metabolism of fats and carbohydrates. The central role

	of CoA in the metabolism of lipids.
Section 8. Metabolism of proteins.	Topic 8.1. Metabolism of proteins. Biological value of proteins, essential and non-essential amino acids. Types of pathology in animals associated with the lack of high-grade protein nutrition. The quantity and quality of proteins in animal feed. Digestion of proteins in the gastrointestinal tract. Features of protein metabolism in ruminant animals. Microbial synthesis in the pancreatic, caecum and thick intestine. Absorption of protein decay products. Putrefaction of proteins in the intestines under the influence of microorganisms and mechanisms for neutralizing toxic products. Pathology of protein metabolism in animals. Features of protein metabolism in birds
Section 9. Metabolism of amino acids.	Topic 9.1. Ammonia in cells: ammonia sources, ammonia toxic action mechanism, ammonia binding: an ornithine urea synthesis cycle, formation of glutamine (in urine) and asparagine, reductive amination of α -ketoglutarate, synthesis of creatine, formation and excretion of ammonium salts through the kidneys. Transformations of the nitrogen-free residue of amino acids. Glycogen and ketogenic amino acids. Specific pathways for the metabolism of individual amino acids.
Section 10. Chemistry and metabolism of nucleic acids.	Topic 10.1. Representations of the chemical structure and the biological role of nucleic acids. Biological functions of mononucleotides, the nature of their binding in nucleic acids. Features of the structure and spatial organization of different types of RNA molecules and DNA. Peculiarities of the complex protein metabolism. Splitting and absorption of nucleic acids in the gastrointestinal tract of animals. Degradation and synthesis of nucleotides in the body. The final products of the decay of purine and pyrimidine nucleotides in different animal species. Violations of the metabolism of purine bases. Biosynthesis of nucleic acids and proteins. Replication, repair, transcription.
Section 11. Mineral and water metabolism.	Topic 11.1. The value of water for the animal body. Water, as one of the final products of metabolism in the body. The content of minerals in organs and tissues. Mac and microelements, their biological role. Regulation of the metabolism of water and minerals. Importance of some chemical elements in the animal body.
Section 12. Biological chemistry of blood.	Topic 12.1. Blood is the integrating part of the internal environment of the body. Protein spectrum of plasma. Methods of quantitative analysis of protein fractions of blood, their informativeness. Plasma enzymes. Non-protein organic components of plasma. Mineral components of blood. Age and Specific Features of the Chemical Composition of Blood in Animals Chemical composition of lymph and liquor. Blood coagulation system.

	Participation of blood components in mechanisms of immune defense. Regulation of vascular tone through vasoactive peptides. Respiratory function of blood. Buffer systems of blood plasma.
Section 13. Biological chemistry of muscle tissue.	Topic 13.1. Transformation of chemical energy into energy of mechanical motion. Proteins of myofibrils. Sarcoplasmic proteins; the role of myoglobin. Mechanisms of muscle contraction and relaxation. Biochemical changes in muscles in pathology. Biological chemistry of meat production: the influence of genetic factors, feeding and keeping animals.
Section 14. Biological chemistry of nervous tissue.	Topic 14.1. Cellular elements of the nervous tissue; a brief description of neurons, neuroglia and microglia. The most important neurotransmitter mediators and their receptors; neuropeptides.
Section 15. Biological chemistry of connective tissue of the skin, bone and wool.	Topic 15.1. Variety of connective tissues. Elastic fibers. Metabolism of collagen and elastin. Cartilage as a special variant of connective tissue. Collagen. Elastin. Proteoglycans. Glycosaminoglycans. Cellular elements of bone tissue. Composition of collagen fibers of bone tissue.
Section 16. Biological chemistry of kidney and urine	Topic 16.1. Kidneys as the main organ of excretion of terminal metabolites. Clearance (clearance) of the blood plasma component as an indicator of the effectiveness of its excretion by the kidneys. The process of urine formation. Criteria for assessing glomerular filtration. Molecular mechanisms of reabsorption and secretion in the renal tubules. Normal and pathological components of blood and urine.
Section 17. Chemical composition of milk and regulation of its formation.	Topic 17.1. Protein and amino acid composition of milk, mineral composition of milk. Some features of the milk composition of different farm animals. The nutritional value of milk. The chemical composition of egg yolk, the chemical composition of egg white, the chemical composition of the shell. The nutritional value of eggs.

Course title	Virology and Biotechnology
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. The discovery of viruses and the history of their study	Topic 1.1. The nature and origin of viruses. Their differences from other infectious agents. The role of viruses in infectious pathology of animals and humans. Economic damage caused to livestock by human viral diseases.
Section 2. The structure and chemical composition of viruses.	Topic 2.1. Forms of existence of viruses in nature. Principles of Virion Organization. The shape and size of the virions. Types of symmetry and their conditionality. Types of viral genomes. Structural proteins. The ability of virions to self-assemble. Lipids and carbohydrates of

	virions, their origin and significance.
Section 3. Classification of viruses, its scientific and practical value.	Topic 3.1. Brief description of the main families
Section 4. Reproduction of viruses.	Topic 4.1. Forms of interaction of viruses with cells: productive, integrative and latent infection. Reproduction of viruses and a diagram of the main processes that ensure the implementation of genetic information.
Section 5. Cultivation of viruses.	Topic 5.1. Cultivation of viruses in the body of naturally susceptible and laboratory animals, on chicken embryos, cell culture. The use of these biological systems in laboratory diagnostics of viral diseases.
Section 6. Pathogenesis of viral diseases of animals.	Topic 6.1. Pathways for viruses to enter the body of animals and barriers along these pathways. Primary localization and circulation of the virus. The tropism of viruses and its conditionality. The mechanism of the damaging effect of viruses on cells. Latent, chronic persistent, slow viral and prion infections.
Section 7. Features of antiviral immunity.	Topic 7.1. Factors of nonspecific antiviral protection of animals. Factors of specific cellular and humoral antiviral immunity. Interaction of cellular and humoral links in the formation of antiviral immunity.
Section 8. Specific prevention of viral diseases in animals.	Topic 8.1. Live and inactivated antiviral vaccines. Basic principles of obtaining and control of live vaccines. Principles of obtaining and control of inactivated antiviral vaccines. Subunit and genetically engineered vaccines. Advantages and disadvantages of different types of antiviral vaccines. Their practical application.
Section 9. Serological tests in virology.	Topic 9.1. The general principle of serological reactions and their differences from each other. RN, RNGA, RSK, RIF, RDP, IFA.
Section 10. Principles of diagnostics of viral diseases of animals.	Topic 10.1. Preliminary diagnosis based on clinical symptoms, pathological changes and epizootic data. The final diagnosis is based on the indication and identification of viruses in the body of sick animals. Evidence for the etiological role of the isolated viruses.
Section 11. Poxvirus family	Topic 11.1. Characterization of viruses, classification, main diseases (smallpox viruses, rabbit myxomatosis, African swine fever virus), methods of laboratory diagnostics, specific prevention.
Section 12. Herpesvirus family.	Topic 12.1. Characteristics of viruses, classification, main diseases (viruses of Aujeszky's, Marek's diseases, infectious bovine rhinotracheitis), methods of laboratory diagnostics, specific prevention.
Section 13. Family of Adenoviruses.	Topic 13.1. Characterization of viruses, classification, main diseases (avian adenoviruses (CELO, EDS), adenovirus infections of cattle, horses, dogs, pigs, sheep and goats), methods of laboratory diagnostics, specific prophylaxis.
Section 14. Family Picornaviruses. Calicivirus family	Topic 14.1. Characteristics of viruses, classification, main diseases (FMD. Teschen's disease. SMEDI syndrome), methods of laboratory diagnostics, specific prophylaxis Vesicular exanthema of pigs.

Section 15. The Togavirus family. Family Flaviruses Family Orthomyxoviruses	Topic 15.1. Characterization of viruses, classification, major diseases (equine encephalomyelitis viruses), methods of laboratory diagnostics, specific prevention. Swine fever. Characterization of viruses, classification, major diseases (influenza viruses), methods of laboratory diagnostics, specific prevention
Section 16. Family Paramyxoviruses	Topic 16.1. Characteristics of viruses, classification, main diseases (Newcastle disease virus. Cattle parainfluenza. Respiratory syncytial virus of cattle. Cattle plague. Carnivore distemper), methods of laboratory diagnostics, specific prevention.
Section 17. Reoviruses family. Birnavirus family	Topic 17.1. Characterization of viruses, classification, major diseases (rotavirus diarrhea of calves. Bluetongue), methods of laboratory diagnostics, specific prophylaxis. Gumboro virus.
Section 18. Family of Retroviruses.	Topic 18.1. Characteristics of viruses, classification, main diseases (bovine leukemia virus. Oncoviruses of mice, cats, monkeys), laboratory diagnostics, specific prevention.
Section 19. Prions and infections caused by them.	Topic 19.1. Scrapy, mink transmissible encephalopathy, bovine spongiform encephalopathy.

Course title	Physiology and Ethology of Animals
Course workload, CU/ac.h.	9/324
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Excitable tissues.	Topic 1.1 Introduction to Physiology.
	Topic 1.2 Physiology of excitable tissues.
	Topic 1.3 Physiology of nerve fibers and muscles.
Section 2. Nervous System.	Topic 2.1 Physiology of the Central Nervous System.
	Topic 2.2 Physiology of the spinal cord.
	Topic 2.3 Brain Physiology.
	Topic 2.4 Physiology of Higher Nervous Activity.
	Topic 2.5 Autonomic nervous system.
Section 3. The blood system.	Topic 3.1 Physiology of blood: functions, properties.
	Topic 3.2 Corpuscular elements of blood.
	Topic 3.3 Leukocyte formula.
	Topic 3.4 Blood physiology: hemoglobin, plasma, lymph.
	Topic 3.5 Blood physiology: hemostasis.
	Topic 3.6 Blood groups, blood transfusion.
	Topic 3.7 Physiology of the immune system.

Section 4. Endocrine glands.	Topic 4.1 Physiology of the endocrine glands.
Section 5. Physiological adaptation of animals.	Topic 5.1 Physiology of animal adaptation.
Section 6. Physiology of lactation.	Topic 6.1 Physiology of lactation of animals.
Section 7. The cardiovascular system.	Topic 7.1 Physiology of the heart: functions and properties of the heart muscle.
	Topic 7.2 Physiology of the heart: conduction system, biphasic rhythm, cardiac impulse, tones.
	Topic 7.3 Physiology of blood circulation: fundamentals of hemodynamics.
	Topic 7.4 Physiology of blood circulation: pulse, blood pressure, electrocardiography.
Section 8. Digestive system.	Topic 8.1 Physiology of digestion in the oral cavity.
	Topic 8.2 Physiology of digestion in the stomach.
	Topic 8.3 Physiology of digestion in the intestine.
	Topic 8.4 Peculiarities of digestion in ruminants.
Section 9. Respiratory system.	Topic 9.1 Respiratory physiology: inhalation-exhalation mechanism, vital capacity of the lungs.
	Topic 9.2 Respiratory physiology: gas exchange, regulation.
Section 10. Metabolism and energy.	Topic 10.1 Metabolism, protein, fat, carbohydrate, water and mineral metabolism.
	Topic 10.2 Energy exchange.
Section 11. The reproductive system.	Topic 11.1 Physiology of reproduction.
Section 12. Excretory system.	Topic 12.1 Physiology of excretion.
Section 13. Analyzer systems.	Topic 13.1 Physiology of visual, auditory, skin, gustatory and olfactory analyzers.
Section 14. Ethology.	Topic 14.1 Studying the characteristics of animal behavior.

Course title	Animal Breeding with the Basics of Private Animal Husbandry
Course workload, CU/ac.h.	7/252

CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Introduction	Topic 1.1. The origin of animals, breeds and their breeding.
Section 2. The origin of animal species.	Topic 2.1. The concept of wild, domestic, agricultural and domesticated animals.
Section 3. Animal breeds.	Topic 3.1. Properties, structure and composition of rocks.
	Topic 3.2. Factors causing the formation and variability in animals.
	Topic 3.3. Acclimatization.
Section 4. Constitution, exterior, interior.	Topic 4.1. Basic principles of classification of types of constitution. The connection of the constitution with various manifestations of the vital activity of the organism.
	Topic 4.2. Methods of studying the exterior, interior. The use of interior indicators in breeding.
Section 5. Individual development of animals.	Topic 5.1. Concepts of growth and development. Patterns of ontogenesis.
	Topic 5.2. Embryonic and postembryonic development. Factors affecting growth and development. Control of the growth and development of animals.
Section 6. Productivity of animals.	Topic 6.1. Evaluation of animals by productivity. Factors affecting productivity (heredity, environment, reproductive abilities, suitability for industrial technology).
	Topic 6.2. Principles of assessing the productivity of different animal species. Assessment of own productivity.
Section 7. Selection, forms and methods of selection.	Topic 7.1. The essence and signs of selection. Conditions affecting the effectiveness of selection.
	Topic 7.2. Genetic basis of selection. Forms of selection. Selection by origin.
	Topic 7.3. Pedigrees. Selection by the quality of offspring.
Section 8. Selection of farm animals.	Topic 8.1. The concept, forms and methods of selection. Selection and selection is the basis of selection. Selection according to the compatibility of genotypes.
	Topic 8.2. Heterosis: concept, theories, selection for heterosis. Importance in animal husbandry.
Section 9. Methods of breeding farm animals.	Topic 9.1. Purebred breeding. Breeding by lines and families
	Topic 9.2. Related mating (inbreeding). Interbreeding. Hybridization.
Section 10. Selection and breeding work in animal husbandry.	Topic 10.1. Production of products in the conditions of specialization, concentration of production. Selection of breeds, acquisition of the herd.
	Topic 10.2. The relationship of breeding and commercial animal husbandry. Planning of breeding work.
	Topic 10.3. Large-scale breeding.

Section 11. Cattle breeding.	Topic 11.1. Systems and methods of keeping cattle at different times of the year.
	Topic 11.2. Reproduction of cattle. Reproductive and sexual cycles of a cow. The choice of animals in the state of hunting. Breeding and calving techniques.
	Topic 11.3. Rearing of young animals. Cultivation of repair young animals.
Section 12. Pig breeding.	Topic 12.1. Specialization and types of pig farms. Methods of keeping in relation to sex, age and technological groups of pigs.
	Topic 12.2. Reproduction of pigs. Reproductive and sexual cycle of queens. Selection of animals that are in a state of hunting. Planning of farrowing. Preparation of animals for farrowing and its implementation.
	Topic 12.3. Raising suckling pigs, piglets from weaning to fattening. Selection and introduction of repair young animals into the herd.
Section 13. Sheep breeding.	Topic 13.1. Features of reproduction. Lambing season.
	Topic 13.2. Reproduction of sheep. Methods of rearing young animals. Organization of weaning.
	Topic 13.3. Formation of otar. Keeping sheep in summer and winter. Fattening, feeding sheep, organization of shearing.
Section 14. Horse breeding.	Topic 14.1. Working qualities and their use.
	Topic 14.2. Productive horse breeding. Reproduction, cultivation, maintenance of horses.
Section 15. Poultry farming.	Topic 15.1. Cultivation systems and methods of maintenance.
	Topic 15.2. Acquisition, maintenance, maintenance of the parent herd in egg production.
	Topic 15.3. Egg incubation. Cultivation of repair young animals. Production of broiler meat.

Course title	Animal Health and Welfare
Course workload, CU/ac.h.	5/180
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. General hygiene	Topic 1.1. Air hygiene.
	Topic 1.2. Hygiene of the microclimate.

	Topic 1.3. Soil hygiene.
	Topic 1.4. Hygiene of water supply.
	Topic 1.5. Hygiene of feed.
	Topic 1.6. Keeping animals.
	Topic 1.7. Hygiene of pasture maintenance, transportation of animals and raw materials.
	Topic 1.8. Hygiene of livestock facilities.
	Topic 1.9. Hygiene of sanitary equipment.
	Topic 1.10. Personal hygiene of employees working with animals.
	Topic 1.11. Environmental hygiene.
Section 2. Private hygiene	Topic 2.1. Hygiene of cattle.
	Topic 2.2. Hygiene of pigs and MRS.
	Topic 2.3. Hygiene of horses.
	Topic 2.4. Hygiene of poultry.

Course title	Feeding Animals with the Basics of Forage Production
Course workload, CU/ac.h.	7/252
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Assessment of feed nutrition.	Topic 1.1 Chemical composition of feed as a primary indicator of their nutritional value. The content and concentration of nutrients in feed.
	Topic 1.2 Determination of digestibility of feeds and diets. The use of nutrients in the animal's body.
	Topic 1.3 Energy nutrition of feed. CE and feed units. Energy nutritional value of feed. Exchange energy.
	Topic 1.4 Protein nutrition of feed.
	Topic 1.5 Mineral and vitamin nutrition of feed.
Section 2. Feed.	Topic 2.1 Production evaluation of feed.
	Topic 2.2 Analysis of feeds of various origins.
	Topic 2.3 Types of feed and their purpose.
Section 3. Normalized feeding of animals of different species.	Topic 3.1 Norms of animal feeding.
	Topic 3.2 The technique of making rations.
	Topic 3.3 Analysis of diets.
	Topic 3.4 Feeding cattle.
	Topic 3.5 Feeding sheep.

	Topic 3.6 Feeding goats.
	Topic 3.7 Feeding horses.
	Topic 3.8 Feeding pigs.
	Topic 3.9 Feeding birds.
	Topic 3.10 Feeding dogs and cats.

Course title	Pathological Physiology
Course workload, CU/ac.h.	9/324
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. General pathological physiology	Topic 1. Pathological physiology as a fundamental science and academic discipline.
	Topic 1.1 General nosology.
	Topic 1.2 General etiology.
	Topic 1.3 General pathogenesis.
	Topic 1.4 The effect of pathogenic environmental factors.
	Topic 1.5 Urgent conditions.
	Topic 1.6 Reactivity and resistance of the body.
	Topic 1.7 Disorders of local blood and lymph circulation.
	Topic 1.8 Inflammation.
	Topic 1.9 Disorders of thermoregulation of the body. Fevers.
	Topic 1.10 Pathological physiology of metabolic and energy disorders.
Topic 1.11 Tumor growth.	
Section 2. Private pathological physiology.	Topic 2. Blood pathophysiology.
	Topic 2.1 Pathophysiology of the cardiovascular system.
	Topic 2.2 Pathophysiology of the respiratory system.
	Topic 2.3 Pathophysiology of the excretory system (kidneys).
	Topic 2.4 Pathophysiology of digestion.
	Topic 2.5 Pathophysiology of the liver, pancreas.
	Topic 2.6 Pathophysiology of the endocrine system.
	Topic 2.7 Pathophysiology of the immune system.
Topic 2.8 Pathophysiology of the nervous system.	

Course title	Veterinary Pharmacology
Course workload, CU/ac.h.	8/288
CONTENT OF THE DISCIPLINE	
Sections	Topics

Section 1. General pharmacology. General recipe.	Topic 1.1. General pharmacology.
	Topic 1.2. General recipe.
Section 2. Funds acting on the nervous system.	Topic 2.1. Remedies acting on afferent and efferent innervation.
	Topic 2.2. Substances acting on the central nervous system.
Section 3. Substances that regulate the functions of individual organs and systems.	Topic 3.1. Substances affecting respiratory and digestive function.
	Topic 3.2. Substances affecting the excretory function of the kidneys, cardiovascular system, hemostasis, hematopoiesis.
Section 4. Substances that primarily affect metabolic processes.	Topic 4.1. Hormones and their analogues.
	Topic 4.2. Vitamins and enzymes.
	Topic 4.3. Mineral substances.
Section 5. Means, correcting the immune status and productivity of animals.	Topic 5.1. Remedies affecting immune processes.
	Topic 5.2. Means correcting the immune status and productivity of animals.
Section 6. Antimicrobial, antiparasitic, antitumor agents.	Topic 6.1. Disinfectants and antiseptics.
	Topic 6.2. Chemotherapeutic agents.
	Topic 6.3. Rodenticides.

Course title	Clinical Diagnostics
Course workload, CU/ac.h.	7/252
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. General clinical diagnosis.	Topic 1.1 Introduction.
	Topic 1.2 Biogeocenotic diagnostics.
Section 2. Private clinical diagnostics. Cardiovascular and respiratory systems.	Topic 2. 1 Cardiovascular system.
	Topic 2.2 Respiratory system.
Section 3. Private clinical diagnostics. Organ systems.	Topic 3.1 The digestive system.
	Topic 3.2 Urinary system.
	Topic 3.3 The nervous system.
	Topic 3.4 Fundamentals of clinical biochemistry.
	Topic 3.5 Endocrine system.

Course title	Pathological anatomy
Course workload, CU/ac.h.	8/288
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. General pathological anatomy	Topic 1.1. Thanatology.
	Topic 1.2. Pathohisto technique.

	Topic 1.3. Alterations.
	Topic 1.4. Disorders of blood and lymph circulation.
	Topic 1.5. Inflammation Immunomorphology, immunopathology.
	Topic 1.6. Adaptive and compensatory reactions.
Section 2. Private pathological anatomy	Topic 2.1. Infectious pathology. Pathomorphology of bacterial infections.
	Topic 2.2. Pathomorphology of viral infections.
	Topic 2.3. Pathomorphology of fungal diseases.
	Topic 2.4. Pathomorphology of invasive diseases.
	Topic 2.5. Adaptive and compensatory reactions of tumor growth.
	Topic 2.6. Pathomorphology of infectious diseases.

Course title	Operative Surgery with Topographic Anatomy
Course workload, CU/ac.h.	4/144
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. General concepts and methods of operative surgery.	Topic 1.1 General concepts of operative surgery, (surgical clinic, surgical manipulations, surgical operation).
	Topic 1.2 Fixation of animals, anesthesia, local anesthesia.
	Topic 1.3 Surgical instruments.
	Topic 1.4 Methods of asepsis and antiseptics in operative surgery.
	Topic 1.5. Separation of tissues. Bleeding, types, methods of stopping.
	Topic 1.6. General principles of surgical suture application.
	Topic 1.7. Desmurgy.
Section 2. Methods and features of surgical operations.	Topic 2.1. Operational access.
	Topic 2.2. Operational techniques, types, methods, features.
	Topic 2.3. Features of oncological operations. Principles of ablasy.
	Topic 2.4. Connection of soft tissues. The final stage of the operation.
	Topic 2.5. The connection of dense fabrics. Osteosynthesis.

Course title	Instrumental diagnostic methods
Course workload, CU/ac.h.	2/72

CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Introduction to instrumental diagnostics. X-ray diagnostics.	Topic 1.1 Introduction to instrumental diagnostics.
	Topic 1.2 X-ray diagnostics.
Section 2. Ultrasound examination.	Topic 2.1 Ultrasound examination.
Section 3. Computer and magnetic resonance imaging.	Topic 3.1 Computed tomography.
	Topic 3.2 Magnetic resonance imaging.
Section 4. Electrocardiography, endoscopy and biopsy.	Topic 4.1 Electrocardiography.
	Topic 4.2 Endoscopy.
	Topic 4.3 Biopsy.

Course title	Toxicology
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. General toxicology.	Topic 1: General toxicology
Section 2. Private toxicology.	Topic 2.1 Chemical toxicoses.
	Topic 2.2 Feed toxicosis.
	Topic 2.3 Phytotoxicoses.
	Topic 2.4 Mycotoxicoses.
	Topic 2.5 Toxicosis with poisons of animal origin.
	Topic 2.6 Poisoning by toxic substances.
	Topic 2.7 Poisoning Polychlorinated biphenyls and Polychlorinated biphenyls.

Course title	Obstetrics, Gynecology and Andrology
Course workload, CU/ac.h.	9/324
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Gynecology and Andrology.	Topic 1.1 Introduction. Reproduction physiology. Ovogenesis. Spermogenesis.
	Topic 1.2 The sexual cycle.
	Topic 1.3 Neurohumoral regulation of the sexual cycle.
	Topic 1.4 Physiology of the breast.
	Topic 1.5 Fertilization.
	Topic 1.6 Transplantation of zygotes.
	Topic 1.7 Functional impairment of the ovaries.
Section 2. Obstetrics.	Topic 2.1 Organization of artificial insemination.
	Topic 2.2 Physiology of pregnancy.

	Topic 2.3 Physiology of childbirth.
	Topic 2.4 Pathology of childbirth.
	Topic 2.5 Delivery operations.
	Topic 2.6 Pathology of the postpartum period.
	Topic 2.7 Postpartum uterine inflammation.
	Topic 2.8 Mammary pathology.

Course title	Internal Diseases
Course workload, CU/ac.h.	10/360
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. General therapy and prevention.	Topic 1.1. Theoretical and organizational foundations of prevention and treatment of internal non-infectious diseases.
	Topic 1.2. Means and methods of therapy. Therapeutic technique.
	Topic 1.3. Physiotherapy.
	Topic 1.4. Medical examination.
Section 2. Private therapy and prevention.	Topic 2.1. Metabolic diseases.
	Topic 2.2. Diseases of the respiratory system.
	Topic 2.3. Diseases of the cardiovascular system.
	Topic 2.4. Diseases of the gastrointestinal tract.
	Topic 2.5. Diseases of the central nervous system.
	Topic 2.6. Diseases of the MVS.
	Topic 2.7. Poisoning.
	Topic 2.8. Diseases of young animals.
	Topic 2.9. Diseases of birds.
	Topic 2.10. Diseases of fur-bearing animals.

Course title	General Surgery
Course workload, CU/ac.h.	4/144
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Inflammation. Surgical infection.	Topic 1.1 Trauma. Traumatic illness
	Topic 1.2 Diagnosis of inflammatory processes.
	Topic 1.3 Features of the course of inflammatory processes in the skin, subcutaneous fat, muscles, tendon-ligamentous apparatus, body cavities.
	Topic 1.4 Surgical infection. Local manifestations.
	Topic 1.5 Surgical infection. Systemic manifestations.
	Topic 1.6 Treatment of inflammatory processes by methods of etiotropic and pathogenetic therapy.
Section 2. Closed mechanical damages.	Topic 2.1 Classification of closed mechanical damages.
	Topic 2.2 Methods of diagnosis of ZMP.
	Topic 2.3 Differential diagnosis of hematomas,

	extravasates, abscesses.
	Topic 2.4 Bone injuries. Injuries of the tendon-ligamentous apparatus.
	Topic 2.5 Injuries of soft tissues and internal organs.
Section 3. Biology of the wound process.	Topic 3.1 Types of wounds, features of diagnosis and treatment of certain types of wounds.
	Topic 3.2 Drains, types, methods of setting drains.
	Topic 3.3 Granulation tissue.
	Topic 3.4 Features of the wound process in different animal species.
	Topic 3.5 Features of wound treatment and complications.

Course title	Private Veterinary Surgery
Course workload, CU/ac.h.	5/180
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Private surgery.	Topic 1.1 Surgical diseases in the head and neck.
	Topic 1.2 Surgical diseases in the chest and abdomen.
	Topic 1.3 Surgical diseases of the abdominal wall and abdominal organs. Herniotomy.
	Topic 1.4 Urogenital surgery. Castration.
Section 2. Veterinary orthopedics.	Topic 2.1 Diagnostics and therapy of limb diseases.
Section 3. Veterinary ophthalmology.	Topic 3.1 Diagnosis and therapy of eye diseases.

Course title	Parasitology and Invasive Diseases
Course workload, CU/ac.h.	8/288
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Introduction to veterinary parasitology.	Topic 1.1. The discipline is a system of knowledge about veterinary parasitology.
	Topic 1.2. A brief history of the development of parasitology. The role of Russian scientists in the development of parasitology.
	Topic 1.3. Safety precautions when working with animals suspected of being infected with invasive diseases.
	Topic 1.4. Economic damage caused by invasive diseases.
Section 2. Veterinary protozoology.	Topic 2.1. Pathogenesis and clinical signs of piroplasmidoses of animals.
	Topic 2.2. Methods of diagnosis of protozoa.
	Topic 2.3. Toxoplasmosis of animals and humans. Features of the course, diagnosis, treatment and prevention.
Section 3. Veterinary entomology.	Topic 3.1. Diagnosis and treatment of entomoses.
	Topic 3.2. Insecticides and repellents.

	Topic 3.3. Measures to combat entomoses.
Section 4. Veterinary acarology.	Topic 4.1. Parasitiform mites – ectoparasites and carriers of pathogens.
	Topic 4.2. Measures to combat ixodic ticks.
	Topic 4.3. Diagnosis and treatment of acaroses.
	Topic 4.4. Acaricides and repellents.
Section 5. Veterinary helminthology.	Topic 5.1. Basic methods of diagnosis of helminthiasis. Helmintholaryoscopy, helminthoscopy, helminthoscopy.
	Topic 5.2. Features of the morphology of suckers.
	Topic 5.3. Methods of diagnosis of trematodoses.
	Topic 5.4. Basics of prevention and treatment of trematodoses.
	Topic 5.5. Larval stages of cestodes (cysticercus, cenurus, cysticercoid, echinococcus, alveococcus, strobilocercus tetratidium).
	Topic 5.6. Larval teniidoses.
	Topic 5.7. Imaginal teniidoses.
	Topic 5.8. Diagnosis of imaginal cestodoses.
	Topic 5.9. Basic methods of diagnosis of nematodes. Trichinelloscopy.
	Topic 5.10. The study of the helminthological situation at livestock facilities.

Course title	Epizootology and Infectious Diseases
Course workload, CU/ac.h.	11/396
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. General epizootology. Introduction to epizootology and infectology.	Topic 1.1. Introduction to veterinary infectology.
	Topic 1.2. General principles of the approach to working with animals in case of suspected infectious disease.
	Topic 1.3. Logistics and equipment.
	Topic 1.4. Epizootological examination of the object.
	Topic 1.5. Rules for the collection of pathological material.
Section 2. The concept of the epizootic process.	Topic 2.1. Epizootic chain.
	Topic 2.2. The driving forces of the epizootic process.
	Topic 2.3. Sources of the pathogen.
	Topic 2.4. Mechanisms of pathogen transmission.

Section 3. Infection and immunity.	Topic 3.1. The doctrine of infection. Infectious process.
	Topic 3.2. The importance of a microorganism in the development of infection and its pathogenicity. Forms of infection.
	Topic 3.3. The immune system of the animal body.
	Topic 3.4. Anti-infectious immunity.
Section 4. Diagnosis of infectious diseases.	Topic 4.1. Epizootological diagnostics of infectious diseases.
	Topic 4.2. Clinical diagnosis of infectious diseases.
	Topic 4.3. Pathomorphological diagnostics of infectious diseases.
	Topic 4.4. Allergic diagnostics of infectious diseases.
	Topic 4.5. Laboratory diagnostics of infectious diseases.
	Topic 4.6. Serological diagnostics of infectious diseases
	Topic 4.7. Virological diagnostics of infectious diseases.
Section 5. Antiepidemiological and preventive measures.	Topic 5.1. Principles of antiepidemiological work.
	Topic 5.2. Veterinary and sanitary rules for the prevention and control of infectious diseases of animals.
	Topic 5.3 General prevention.
	Topic 5.4. Specific prevention.
	Topic 5.5. Principles of treatment of infectious diseases of animals.
Section 6. Private epizootology. Classification of infectious diseases.	Topic 6.1. Classification of infectious diseases.
	Topic 6.2. Natural focal infections.
Section 7. Especially dangerous infectious diseases of animals.	Topic 7.1. Diseases common to animals of different species.
	Topic 7.2. Animal diseases in the city.
	Topic 7.3. Anthroponoses.
Section 8. Infectious diseases of ruminants.	Topic 8.1. Infectious diseases of cattle.
	Topic 8.2. Infectious diseases of small cattle.
	Topic 8.3. Infectious diseases of camels.
Section 9. Infectious diseases of horses.	Topic 9.1. Infectious diseases of horses.

Section 10. Infectious diseases of pigs.	Topic 10.1. Infectious diseases of pigs.
Section 11. Infectious diseases of young animals.	Topic 11.1. Infectious diseases of young ruminants.
	Topic 11.2. Infectious diseases of young horses.
	Topic 11.3. Infectious diseases of young pigs.
	Topic 11.4. Infectious diseases of young unproductive animals.
Section 12. Infectious diseases of birds.	Topic 12.1. Infectious diseases of birds.
Section 13. Infectious diseases of carnivores.	Topic 13.1. Infectious diseases of dogs.
	Topic 13.2. Infectious diseases of cats.
	Topic 13.3. Infectious diseases of fur-bearing animals.
Section 14. Infectious diseases of fish.	Topic 14.1. Infectious diseases of fish.
Section 15. Infectious diseases of bees.	Topic 15.1. Infectious diseases of bees.
Section 16. Slow animal infections.	Topic 16.1. Infectious diseases of animals caused by prions.
Section 17. Infectious diseases of animals caused by rickettsia and chlamydia.	Topic 17.1. Infectious diseases of animals caused by rickettsias
	Topic 17.2. Infectious diseases of animals caused by chlamydia.

Course title	Veterinary and Sanitary Examination
Course workload, CU/ac.h.	7/252
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Basics of veterinary and sanitary expertise.	Topic 1.1 Transportation of animals to slaughterhouses.
	Topic 1.2 Pre-slaughter housing of animals and its importance.
	Topic 1.3 Animal processing plants and veterinary and sanitary requirements for them.
Section 2. Fundamentals of technology and hygiene of animal processing.	Topic 2.1 Fundamentals of technology and hygiene of animal processing.
	Topic 2.2 Organization and methods of inspection of heads, carcasses and internal organs.
	Topic 2.3 Meat changes due to improper storage.
	Topic 2.4 Basics of technology and hygiene for preserving meat and meat products.

	Topic 2.5 Basics of technology, hygiene and veterinary and sanitary expertise of sausages and ham products.
	Topic 2.6 Basics of technology, hygiene of poultry processing and inspection methods of carcasses and internal organs.
Section 3. Veterinary and sanitary examination of meat, animal and plant products	Topic 3.1 Veterinary and sanitary examination of animal slaughter products for infectious diseases.
	Topic 3.2 Veterinary and sanitary examination of animal slaughter products for invasive diseases.
	Topic 3.3 Sanitary and veterinary expertise of slaughter products for non-communicable diseases, animal poisoning, antibiotic treatment and radioactive substances.
	Topic 3.4 Veterinary and sanitary examination of poultry, rabbits and nutria meat.
	Theme 3.5 Veterinary and sanitary examination of eggs, fish and meat of wild animals.
	Topic 3.6 Animal health expertise of meat, meat and other animal products, plant food products.
	Topic 3.7 Animal health and sanitary examination of milk and dairy products.
	Topic 3.8 Animal health and sanitary examination of honey.
	Topic 3.9 Nutritional value of mushrooms and their classification.
Section 4. Basics of technology and hygiene in the canning of meat and meat products.	Topic 4.1 Fundamentals of technology and hygiene in canning meat and meat products.
	Topic 4.2 Preservation of meat and meat products at low temperature.
	Topic 4.3 Preserving meat and meat products at high temperature.
	Theme 4.4 Preserving meat by salting.
	Topic 4.5 New methods of preserving meat.

Course title	Organization of Veterinary Affairs
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Veterinary business of the Russian Federation in	Topic 1.1. Legislation on veterinary issues

modern conditions	
Section 2. State Veterinary Service of the Russian Federation	Topic 2.1. State Veterinary Service on the territory of the Russian Federation
	Topic 2.2. Federal State information system in the field of veterinary medicine
Section 3. Ensuring the epizootic well-being of the country	Topic 3.1. General requirements for the prevention of animal diseases and ensuring veterinary safety of animal products
	Topic 3.2. Protection of the territory of the Russian Federation from the introduction of infectious diseases from foreign countries
Section 4. Veterinary activities	Topic 4.1. Organization and procedure of anti-epizootic measures aimed at the prevention and elimination of infectious animal diseases
	Topic 4.2. Economics and financing of veterinary measures
Section 5. Veterinary services and organization of work of veterinary workers	Topic 5.1. Veterinary services and organization of work of veterinary workers of the State veterinary service
Section 6. Private veterinary services	Topic 6.1. Legislative bases of private veterinary practice

Course title	Foreign Language
Course workload, CU/ac.h.	10/360
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1 Foreign Language	<p>Topic 1.1. Grammar. Repetition of the English verb tenses Present, Past, Future (Simple, Continuous, Perfect, Perfect Continuous). Passive voice. Modal verbs. Infinitive verb forms. Adjectives of time and condition, relative adjectives. Direct and indirect speech. Reconciliation of tenses. Vocabulary and idioms. Consolidation of the most frequently used general language vocabulary, reflecting broad and narrow specialization. Expansion of the vocabulary at the expense of lexical units forming the basis of the register of scientific speech. Familiarity with branch dictionaries and reference books. The stable word combinations most frequently encountered in scientific speech. Word combinations: free word combinations, morpho-syntactically and lexically-phraseologically related word combinations, idiomatic expressions. Comparison of "nonidiomatic" (free) combination of words and more idiomatic ways of expressing a thought.</p>
Section 2. Foreign language for business communication	<p>Topic 2.1. Business communication and means of communication: Formation and style of business letters. Electronic messages. Basic types of commercial letter. Telephone conversations. Writing skills: CV. Business memo. Business plan. Review. Article. Report. Communicative skills: Communication with English-speaking partners. Resolving conflict situations. Success in</p>

	negotiations. Successful presentations. Understanding of the peculiarities of intercultural contacts.
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Course title	Russian as a Foreign Language
Course workload, CU/ac.h.	10/360

CONTENT OF THE DISCIPLINE

Sections	Topics
Section 1. General Characteristics of the Subject	Topic 1.1. Component composition of the subject. Complete component composition of the subject. Incomplete component composition of the subject. Presence / absence of component in the structure. Joining components of the subject. Location of the object. The orientation of the object in space. The way the apparatus is positioned.
	Topic 1.2. Qualitative and quantitative composition of the subject. Qualitative composition of the subject. Qualitative-quantitative composition of the subject.
	Topic 1.3. The shape and relief of the surface of the object. The shape of the object. The relief of the surface of objects.
Section 2. The subject and its main features	Topic 2.1. Qualitative characteristics of the object. Color of the object. Taste and smell of the object. Consistency of the object. Properties of the object.
	Topic 2.2. Quantitative characteristics of the object. The numerical value of the size, magnitude, weight of the object. Fluctuations in the size of the object. Maximum size of an object. Exceeding a certain size of the object.
	Topic 2.3. The function of an object. Identification of function. The essence of function. The conditionality of the function of the subject.
	Topic 2.4. Classification of objects. Classes of objects. Characteristic of classification and classes of objects. Representatives of a class of objects.
Section 3. Basic attributes and characteristics of the process	Topic 3.1. The essence of the process. Existence of process, propagators with the meaning of circumstantial characteristic of the process. Types (types, forms) of a process. Carriers of a process.

	<p>Topic 3.2. The stages of the process. The presence and number of stages in a process. The sequence of the stages of the process and the place of the stage in the process. Processes occurring in each of the stages. Duration of a stage.</p>
	<p>Topic 3.3. The conditionality of the process. The relationship between a process and a factor. Factor-cause. Factor-condition. The nature of the influence of the factor-condition on the process.</p>
<p>Section 4. Life activity of a biological organism And its characteristics</p>	<p>Topic 4.1. Types of process mechanisms. The emergence of a new object and its demise. Formation of objects. Disappearance of objects.</p>
	<p>Topic 4.2. Changing the location of the object: the motion of the fluid. Fluid motion. The nature and direction of motion.</p>
	<p>Topic 4.3. Changing the dynamics of the process. Process disruption and termination. Process disruption. Process termination.</p>
	<p>Topic 4.4. The role of the process. Evaluation of the process in terms of importance, significance. Process evaluation in terms of benefit/harm.</p>

Course title	Russian Language and Culture of Speech
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
<p>Section 1. Rhetoric as a Science and the Art of Eloquence</p>	<p>Topic 1.1. A brief history of the development of oratory. - Orators of Ancient Greece and Rome: Cicero, Aristotle, Quintilian, Plato, Socrates, etc. - Well-known orators of Russia. - The rhetorical canon and modern eloquence. - Stages of the classical rhetorical canon. - Rhetoric in the professional sphere and public life of man of the information age. - General and private rhetoric. - Laws and principles of modern general rhetoric. - Neorhetoric.</p>
	<p>Topic 1.2. Types of oratorical speeches. - Classification of oratorical speeches according to their sphere of application: academic, eloquence social and political, social and domestic, spiritual, judicial. - Their specificity, outstanding orators. - Types of oratorical speeches by their target setting: epideictic speech, argumentative speech (persuasive and agitating) informing speech, entertaining speech</p>
<p>Section 2. Speech Impact and</p>	<p>Topic 2.1. Methods, strategies and tactics of speech</p>

<p>Persuasive Techniques</p>	<p>influence.</p> <ul style="list-style-type: none"> - Factors of speech influence. - Communicative position and techniques to enhance it. - Speech influence and manipulation. - Ways to overcome speech aggression. <hr/> <p>Topic 2.2. Types of methods of persuasion.</p> <ul style="list-style-type: none"> - Classification of methods of persuasion by the nature of the audience: universal and non-universal (contextual). - Ways of universal argumentation: empirical argumentation, theoretical argumentation. - Ways of theoretical argumentation logical argumentation, systematic argumentation, principled verifiability and principled rebuttability, condition of compatibility, methodological argumentation. - 14 rules of persuasion: the rules of Homer, Socrates, Pascal, etc.
<p>Section 3. Public Speaking</p>	<p>Topic 3.1. Features of public speaking.</p> <ul style="list-style-type: none"> - The main types of public speaking (in purpose and form). Their purpose, general characteristics, and specific features. - Classification of audiences by volume and homogeneity. Specifics of how speakers work in auditoria of various types. Techniques for managing an audience. <hr/> <p>Topic 3.2. The main stages and principles of the preparation of public speaking (IDEMA).</p> <ul style="list-style-type: none"> - The composition of a speech. The role of the introduction. The structure of the main part of the speech. The final word. - An abbreviated record of a speech: an outline, theses, a plan. The volume of the speech. Techniques for attracting attention and interest. Methods for presenting the material. Auxiliary material. <hr/> <p>Topic 3.3. The main functions of the speaker during a speech.</p> <ul style="list-style-type: none"> - Mistakes made during a speech. The speaker's communicative culture. Communicative qualities of speech (accuracy, purity, richness, effectiveness), their influence on the effectiveness of communication between the speaker and the audience. Qualities of the orator's voice.
<p>Section 4. Communication in the structure of everyday and professional activities of a specialist</p>	<p>Topic 4.1 Rhetoric of conversation.</p> <ul style="list-style-type: none"> - The structure of a conversation. Types of dialogic communication in a professional environment. Professional conversation, its types, content and structure of different types in situations of intraprofessional and interprofessional communication. <hr/> <p>Topic 4.2. Principles of conflict-free professional communication.</p> <ul style="list-style-type: none"> - Barriers to communication and overcoming them. Ability to listen and hear. Styles of listening. Principles of active listening. <hr/> <p>Topic 4.3. Strategies and tactics of discourse.</p> <ul style="list-style-type: none"> - Discourse in scientific and professional environment.

	Speech etiquette in a professional environment.
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Course title	Maths
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Vector Algebra	Topic 1.1 Addition and multiplication of vectors by a number, scalar product of vectors, angle between two vectors.
Section 2. Operations on Matrices	Topic 2.1 Matrix addition, matrix multiplication by number, zero matrices, square matrices, polynomial of a matrix, unit matrix, product of matrices.
Section 3. Inverse Matrix	Topic 3.1 Methods for finding the inverse matrix.
Section 4. Determinants	Topic 4.1 Triangle rules, Laplace's theorem (determinant decomposition by row or column), determinant reduction to triangular form, minors and algebraic complements.
Section 5. Matrix Rank	Topic 5.1 Matrix rank theorem, matrix column rank theorem, methods of finding an inverse matrix using fringing minors, reducing a matrix to trapezoidal form.
Section 6. Methods for Solving a System of Algebraic Equations	Topic 6.1 Cramer's formulas, inverse matrix method, Gauss method.
Section 7. Investigating and Solving a System of Algebraic Equations	Topic 7.1 Application of the Kronecker-Kapelli theorem, system of homogeneous algebraic equations, construction of the fundamental system of solutions.
Section 8. Complex numbers	Topic 8.1 Geometric representation, forms of recording complex numbers, actions on complex numbers.
Section 9. Elements of Analytical Geometry	Theme 9.1 Straight line equations on the plane and in space, straight line equations using the concepts of normal vector, straight line equations with angle coefficient, straight line equations in segments.
Section 10. Second-order curves	Theme 10.1 Equation of the circle, ellipse, hyperbola and parabola, equation of second-order curves.
Section 11. Equation of a straight line in space	Theme 11.1 A straight line in space, the angle between two straight lines, the conditions of parallelism and perpendicularity of straight lines, the conditions of coplanarity of two straight lines.
Section 12. Equations of the plane	Topic 12.1 Normal and tangent vector of the plane.
Section 13. A straight line and a plane in space	Topic 13.1 Angle between a straight line and a plane, conditions of parallelism of a straight line and a plane, conditions of their perpendicularity.
Section 14. Second-order surfaces	Topic 14.1 The canonical form of second-order surface equations, geometric representation.
Section 15. The concept of a point and its neighborhood.	Topic 15.1 Interval, half-interval, segment, modulus of a number.
Section 16. Ways to set a function	Topic 16.1 Analytical, graphical, tabular, verbal methods of assignment.
Section 17. The concept of the limit of a sequence and a	Topic 17.1 The concept of continuity of a function at a point and on an interval, the limits theorem, the first

function	remarkable limit, the second remarkable limit, classification of discontinuities.
Section 18. The concept of a derivative	Topic 18.1 Table of derivatives, basic elementary functions, rule of finding derivatives, higher order derivatives.
Section 19. Investigating Functions and Drawing Graphs	Theme 19.1 Plan of investigation and construction of a function, asymptotes of a function, the concept of extremes of a function, inflection points.
Section 20. The Undetermined Integral	Theme 20.1 The most important properties of integration, the first-order function, the table of the simplest integrals, the basic methods of integration.
Section 21. The Definite Integral	Topic 21.1 Methods of calculation, basic concepts and properties, Newton-Leibniz formula, integration by parts.
Section 22. Integral Irregularities	Topic 22.1 Integrals with infinite bounds (first kind), integrals from unlimited functions (second kind)
Section 23. Applications of the Indefinite Integral	Topic 23.1 Calculation of areas of flat figures, calculation of the arc length of a curve, calculation of volumes of bodies.
Section 24. Functions of several variables	Theme 24.1 Graph and level line, limit of a function at a point, continuity of a function at a point and on a set, partial derivatives, total differential, partial derivatives and higher order differentials.
Section 25. Directional Derivative and Gradient	Topic 25.1 Definition of directional derivative, definition of gradient, relationship between directional derivative and gradient.
Section 26. Extremum of functions of two variables	Theme 26.1 Definition of extremum of functions of two variables at a point, extremum of functions in the area, conditional extremum, least squares method.

Course title	Introduction to the specialty
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. History of veterinary medicine in the world	Topic 1.1. The origin of veterinary medicine.
	Topic 1.2. Veterinary medicine in the ancient world.
	Topic 1.3. Veterinary medicine in the Middle Ages and Renaissance (V-XV11 centuries).
	Topic 1.4. Veterinary medicine in the Arab world.
	Topic 1.5. Veterinary medicine of the X11 – XX centuries.
	Topic 1.6. Veterinary communities.
Section 2. History of veterinary medicine in Russia.	Topic 2.1. Veterinary medicine of Russia before the XVIII century.
	Topic 2.2. Veterinary medicine of noble Russia (XVIII century).
	Topic 2.3. Measures aimed at preventing mass animal diseases.

	Topic 2.4. Formation of the scientific basis of veterinary sanitation.
	Topic 2.5. Pharmacy and popularization of knowledge of the basics of veterinary medicine.
	Topic 2.6. Veterinary medicine of the period of the formation of pre-capitalist relations in Russia (1800 - 1860).
	Topic 2.7. Veterinary medicine of the period of the formation of capitalism in Russia (from the 60s of the XIX century to 1917).
	Topic 2.8. Veterinary medicine in the years of Soviet power.
	Topic 2.9. Veterinary institutions.
	Topic 2.10. Veterinary medicine during the Great Patriotic War.
	Topic 2.11. Veterinary medicine in the post-war years.

Course title	Immunology
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. General immunology	Topic 1.1. Introduction. History of immunology. Mechanisms of innate immunity.
	Topic 1.2. Organs, tissues and cells of the immune system.
	Topic 1.3. Effector mechanisms of immunity.
Section 2. Clinical immunology	Topic 2.1. Immune response. Mechanisms of hypersensitivity. Autoimmunity.
	Topic 2.2. The immune system of ontogenesis and carcinogenesis. Immunodeficiency.
	Topic 2.3. Immunotherapy.

Course title	Veterinary Sanitation
Course workload, CU/ac.h.	4/144
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. General and scientific foundations of veterinary sanitation.	Topic 1.1 Introduction to veterinary sanitation. Material and technical support.
	Topic 1.2 Logistics.
	Topic 1.3 General technology and mechanization of veterinary and sanitary measures.

Section 2. Private and applied veterinary sanitation.	Topic 2.1 Disinfection. Disinsection. Deratization.
	Topic 2.2 Veterinary sanitation of soil, air, water sources.
	Topic 2.3 Decontamination and utilization of manure, animal waste.

Course title	Processing Technology for Livestock Products
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Meat production in the world and in Russia. History of the meat industry	Topic 1.1 Meat production by animal species and continent.
	Topic 1.2 Development of the meat industry in the 19th and 21st centuries.
Section 2. Types of meat processing plants	Topic 2.1 Sanitary and economic value of animal processing.
	Topic 2.2 Meat processing plants, slaughterhouses, slaughterhouses, poultry slaughterhouses, slaughterhouses.
Section 3. Preparing animals for slaughter	Topic 3.1 Delivery of slaughter animals to meat processing plants.
	Topic 3.2 Acceptance and maintenance of livestock, poultry and rabbits at meat industry enterprises.
Section 4. Slaughter of animals	Topic 4.1. Stunning, exsanguination and collection of food blood, skinning, processing of pork carcasses in the skin.
	Topic 4.2. Removing internal organs, sawing carcasses, veterinary and sanitary control.
	Topic 4.3. Processing of poultry and rabbits.
Section 5. Commodity valuation and branding of carcasses	Topic 5.1 Categories of fatness of meat of cattle, small cattle, pigs, horses, etc.
Section 6. By-product processing technology	Topic 6.1 Technology for processing offal: wool, meat and bone, pulp, mucous.
Section 7. Canning meat	Topic 7.1 Principles and methods of preserving meat.
	Topic 7.2 Preserving meat with low and high temperatures, chemical means.
	Topic 7.3 Smoking meat products.
Section 8. Morphological composition of carcasses	Topic 8.1 The essence and indicators of product quality.
	Topic 8.2 Product properties.
	Topic 8.3 Methods for determining the quality of products.
Section 9. Standardization of animal slaughter products	Topic 9.1 The essence of standardization. GOSTs.

	Topic 9.2 Standardization of meat and meat products.
	Topic 9.3 Standardization of milk and dairy products.
	Topic 9.4 Standardization of eggs.
	Topic 9.5 Standardization of honey.

Course title	Veterinary Deontology
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Introduction. The subject of Deontology.	Topic 1.1 The relationship of ethics and deontology.
	Topic 1.2 The history of the emergence of deontological norms, the connection of veterinary deontology and bioethics.
Section 2. The surrounding reality, as we perceive it.	Topic 2. 1 A look at emerging problems from different perspectives.
	Topic 2.2 The position of the doctor and the position of the owner of the animal.
	Topic 2.3 Search for common. The keys to mutual understanding.
Section 3. Why we live, study and work. Definition of the goal.	Topic 3.1 Goal-setting as the basis of preparation for professional activity and professional activity itself.
Section 4. Interaction with the world.	Topic 4.1 Stages of cognition of the world as the formation of the foundations for professional activity.
	Topic 4.2 Interference in consciousness as a cause of problems of perception of the world and the way to conflicts in professional activity.
Section 5. Feeling yourself in the world relative to other people.	Topic 5.1 Distribution of roles in the interaction between people.
	Topic 5.2 Dependence, independence, consistency as the basis of interaction.
	Topic 5.3 The role of acceptance or rejection of the imposed role in the emergence of professional conflicts.
Section 6. Interaction with people.	Topic 6.1 Ways to influence people to achieve the best possible way to help the patient.
	Topic 6.2 The contract as the basis of cooperation is the way to achieve mutually beneficial relations in the everyday and professional sphere.
Section 7. Management as the main form of influence on people.	Topic 7.1 Relationships between people according to the scheme: manager – managed.
	Topic 7.2 The benefits and dangers of such relationships.
Section 8. Leading in our life. Is it good or bad?	Topic 8.1 Conducting as an opportunity to influence decision-making by a person (client, colleague, manager).

	Topic 8.2 Management as a way to bring the greatest benefit to the patient.
Section 9. Vocational school. Teacher and Student.	Topic 9.1 Stages of mastering professional skills.
	Topic 9.2 The relationship between master and disciple.
	Topic 9.3 Gratitude and tuition fees.
Section 10. The path of a person in life / profession. Strategy and tactics of individual stages of the path in life/ profession.	Topic 10.1 Formation of key points on the professional development and growth map.
	Topic 10.2 Algorithm for setting and solving professional tasks.
	Topic 10.3 Solving "unsolvable problems".
Section 11. Professional conduct.	Topic 11.1 Fundamentals of medical behavior of a veterinarian.
	Topic 11.2 Medical negligence and medical error.
	Topic 11.3 The behavior of a doctor in a professional team.
Section 12. Tactics of management of patients with chronic and incurable diseases.	Topic 12.1 Features of relationships with owners chronically
	Topic 12.2 Features of the curation of chronically ill patients.
	Topic 12.3 sick patients. Questions of euthanasia.
Section 13. Ethical issues in the daily practice of a veterinarian. Medical Reason and Clinical Thinking.	Topic 13.1 Analysis of complex cases in the professional activity of a veterinarian.
	Topic 13.2 Ethics of intercollegiate relations
	Topic 13.3 Conflicts with animal owners and with colleagues.
	Topic 13.4 Development of clinical thinking and points of application of the medical mind.
Section 14. Ethical aspects of professional self-determination.	Topic 14.1 Specialization in choosing a field of professional activity.
	Topic 14.2 Features of various fields of activity of a veterinarian.

Course title	Veterinary Genetics
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Genetics and its place in the system of natural sciences.	Topic 1.1 The subject of genetics.
	Topic 1.2 The concept of heredity and variability.
	Topic 1.3 The history of the development of genetics.
	Topic 1.4 The significance of G. Mendel's works in the development of genetics as a science.
	Topic 1.5 Methods of genetics.
	Topic 1.6 The importance of genetics in agronomy.
Section 2. Patterns of inheritance of traits during sexual	Topic 2.1 Mendel's laws.
	Topic 2.2 Dominance types.

reproduction.	Topic 2.3 Alleles.
	Topic 2.4 Analyzing crossing.
	Topic 2.5 Regularities of inheritance of traits in mono-, di- and polyhybrid crossing
Section 3. Fundamentals of cytogenetics.	Topic 3.1 Cellular structure of organisms.
	Topic 3.2 Cell structure.
	Topic 3.3 Chromosomes, their types and structure.
	Topic 3.4 Cell division.
	Topic 3.5 Mitosis.
	Topic 3.6 The biological significance of mitosis.
	Topic 3.7 Pathology of mitosis.
	Topic 3.8 Meiosis.
	Topic 3.9 Genetic control of meiosis.
	Topic 3.10 The genetic significance of meiosis.
	Topic 3.11 Pathology of meiosis.
	Topic 3.12 Karyotypes.
Section 4. Interaction of non-allelic genes	Topic 4.1 Complementary Gene Interaction.
	Topic 4.2 Suppression.
	Topic 4.3 Dominant epistasis.
	Topic 4.4 Cryptomeria (recessive epistasis).
	Topic 4.5 Polymerism.
	Topic 4.6 Pleiotropy.
	Topic 4.7 Modifier genes.
	Topic 4.8 Multiple alleles.
Section 5. Chromosomal theory of heredity	Topic 5.1 Grip and crossing over.
	Topic 5.2 Chromosomal theory of T.H. Morgan.
	Topic 5.3 Crossover mechanism.
	Topic 5.4 The size of the cross and the linear arrangement of genes in the chromosome.
	Topic 5.5 Single and multiple crossover.
	Topic 5.6 Interference.
	Topic 5.7 Localization of genes.
	Topic 5.8 The linear arrangement of genes in the chromosome.
	Topic 5.9 Genetic maps of chromosomes.
	Topic 5.10 Cytological evidence of crossing over.
	Topic 5.11 Factors Affecting Chromosome Crossing.
Section 6. Genetics of sex.	Topic 6.1 Inheritance of sex-linked traits.
	Topic 6.2 Determination of sex.

	Topic 6.3 Disorders in the development of sex.
Section 7. Variability and methods of studying it	Topic 7.1 Types of variability and methods of study.
	Topic 7.2 The statistical nature of the splitting.
	Topic 7.3 Chi-square test.
	Topic 7.4 Study of the relationship between signs.
Section 8. Molecular basis of heredity	Topic 8.1 Evidence for a genetic role for DNA.
	Topic 8.2 Chemical composition and structure of nucleic acids.
	Topic 8.3 Types and structure of RNA.
	Topic 8.4 Genetic code and its properties.
	Topic 8.5 Protein biosynthesis.
Section 9. Mutational variability. Types of mutations and mutagenic factors	Topic 9.1 Classification of mutations.
	Topic 9.2 Induced and spontaneous mutagenesis.
	Topic 9.3 Mutational process.
	Topic 9.4 Mutagenic factors.
	Topic 9.5 Ionizing radiation and mutations.
	Topic 9.6 Chemical mutagenesis.
	Topic 9.7 Polyploidy and aneuploidy.
Section 10. Population genetics.	Topic 10.1 The concept of populations.
	Topic 10.2 Determination of gene frequencies and genotype ratios in populations.
	Topic 10.3 Hardy-Weinberger's Law.
	Topic 10.4 Population dynamics factors.
Section 11. Genetic abnormalities. Diseases with a hereditary predisposition	Topic 11.1 Genetic, hereditary-environmental and exogenous anomalies
	Topic 11.2 Autosomal and sex-linked inheritance patterns of anomalies
Section 12. Blood groups in humans and animals and biochemical polymorphism	Topic 12.1 Inheritance of blood groups.
	Topic 12.2 The importance of blood groups for practice.
	Topic 12.3 Biochemical polymorphism and its significance.
Section 13. Biotechnology	Topic 13.1 Genetic and cell engineering, cloning, transgenic plants and animals

Course title	Veterinary Radiobiology
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics

Section 1. Physical bases of the action of ionizing radiation. Control methods and devices.	Topic 1.1 Physical bases of the action of ionizing radiation. Control methods and devices.
Section 2. Biological effects of ionizing radiation and safety precautions when working in radiation-contaminated areas	Topic 2.1. Biological effects of ionizing radiation and safety precautions when working in radiation-contaminated areas
Section 3. Target theory. Free radical theory	Topic 3.1. Target theory. Free radical theory
Section 4. Damage repair. Somatic and inherited mutations	Topic 4.1. Damage repair. Somatic and inherited mutations
Section 5. Features of the territory pollution with long-lived radioactive substances	Topic 5.1. Features of the territory pollution with long-lived radioactive substances
Section 6. Transition of radionuclides into livestock products. Excretion from the body	Topic 6.1. Transition of radionuclides into livestock products. Excretion from the body
Section 7. Standards for the content of radionuclides in agricultural facilities.	Topic 7.1. Standards for the content of radionuclides in agricultural facilities.
Section 8. Calculation of doses of external and internal human exposure.	Topic 8.1. Calculation of doses of external and internal human exposure.
Section 9. Radiation sickness of animals: acute and chronic.	Topic 9.1. Radiation sickness of animals: acute and chronic
Section 10. The effect of ionizing radiation on the embryo and fetus	Topic 10.1. The effect of ionizing radiation on the embryo and fetus
Section 11. Long-term effects of radiation. Genetic. action of ionizer. radiation.	Topic 11.1. Long-term effects of radiation. Genetic. action of ionizer. radiation.
Section 12. Lack of modern knowledge about the effect of small doses	Topic 12.1. Lack of modern knowledge about the effect of small doses
Section 13. Features of the action of ionizing radiation in small doses	Topic 13.1. Features of the action of ionizing radiation in small doses
Section 14. Adaptive response. The answer of the "Witness".	Topic 14.1. Adaptive response. The answer of the "Witness".
Section 15. Genome instability	Topic 15.1. Genome instability
Section 16. Damage repair. Somatic and inherited mutations	Topic 16.1. Damage repair. Somatic and inherited mutations

Course title	Forensic Veterinary Examination and Dissection of
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	Animals
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. General principles of forensic veterinary medicine.	Topic 1.1. Subject of forensic veterinary medicine.
	Topic 1.2. The history of the development of forensic veterinary medicine.
	Topic 1.3. Scientific and methodological, procedural and organizational bases of forensic veterinary medicine.
	Topic 1.4. Forensic veterinary examination in civil cases.
	Topic 1.5. The Law of the Russian Federation "On Veterinary Medicine" and its role in the implementation of veterinary measures and forensic veterinary examination.
Section 2. Private forensic veterinary medicine.	Topic 2.1. The modern doctrine of death – thanatology.
	Topic 2.2. Forensic veterinary examination of an animal corpse.
	Topic 2.3. Examination of an animal corpse in case of sudden death.
	Topic 2.4. Examination of injuries and death of an animal from asphyxia.
	Topic 2.5. Examination of damage and death of an animal by drowning.
	Topic 2.6. Examination of an exhumed corpse or individual organs.
	Topic 2.7. Forensic veterinary toxicology.
	Topic 2.8. Forensic veterinary traumatology. Examination of damage of mechanical origin.
	Topic 2.9. Examination of damages caused by the action of extreme temperatures and electricity.
	Topic 2.10. Examination of animals in infectious and invasive pathology.
	Topic 2.11. Examination of the materials of the court case.

Course title	Professional Russian Language
Course workload, CU/ac.h.	10/360
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. ANIMAL DISEASES AND THEIR CHARACTERISTIC	Topic 1.1. General characteristics of the disease. The condition for the occurrence of the disease. The reason for the pathological condition. Classification of diseases.
	Topic 1.2. The clinical picture of the disease: thermal regulation disorders. Types of symptoms. Symptoms and syndromes. Typical symptoms of the disease. The duration of the symptom. Recurrence of symptoms.
	Topic 1.3. The clinical picture of the disease: digestive disorders. Pain as the main symptom of the disease. The nature of the pain. The power of pain. Duration of pain.

	The frequency of pain. Localization of pain. Relief of pain.
	Topic 1.4. The clinical picture of the disease: metabolic disorders. Additional symptoms of the disease. Types of additional symptoms. Characteristics of additional symptoms.
Section 2. PROFESSIONAL AND PRACTICAL ACTIVITY OF THE VETERINARY	Topic 2.1. Methods for examining a sick animal of the survey method.
	Topic 2.2. Methods for the treatment of veterinary diseases. The purpose of the treatment. Indications for use of the treatment method. Contraindications to the use of the treatment method. The procedure for action during treatment. Sequencing. Simultaneity of action. The value of the treatment method.
	Topic 2.3. Equipment used during the treatment procedure. The purpose of the device. The nature of the impact of an object (apparatus, its derivatives) on the body. Recommendations for using the device. The advantage of using the device (its derivatives).
	Topic 2.4. Appointment of a treatment method, medical procedure, drug. The appointment of a medical procedure, a drug. The method of administration of the drug. The mode of administration of the drug.

Course title	Professional Foreign Language
Course workload, CU/ac.h.	10/360
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Professional and practical activity of the veterinary	Topic 1.1. Methods for examining a sick animal . The purpose of the examination method; object of study; the tool (tool) with which to conduct an examination; the value of the survey method.
	Topic 1.2. Methods for the treatment of veterinary diseases. The purpose of the treatment. Indications for use of the treatment method. Contraindications to the use of the treatment method. The procedure for action during treatment. Sequencing. Simultaneity of action. The value of the treatment method.
	Topic 1.3. Equipment used during the treatment procedure. The purpose of the device. The nature of the impact of an object (apparatus, its derivatives) on the body. Recommendations for using the device. The advantage of using the device (its derivatives).
	Topic 1.4. Appointment of a treatment method, medical procedure, drug. The appointment of a medical procedure, a drug. The method of administration of the drug. The mode of administration of the drug.

Course title	Applied Physical Education
Course workload, CU/ac.h.	0/328
CONTENT OF THE DISCIPLINE	

Sections	Topics
Section 1. Practice Section	Topic 1.1. Athletics
	Topic 1.2. Sports games
	Topic 1.3. Gymnastics
	Topic 1.4 Ski training
	Topic 1.5 Independent work of students (extracurricular activities)

Course title	Medicinal and Poisonous Plants
Course workload, CU/ac.h.	2/72

CONTENT OF THE DISCIPLINE

Sections	Topics
Section 1. Introduction.	Topic 1.1. The importance of green plants in nature and human life. Protection of the plant world. Objectives of the course "Medicinal and poisonous plants. The history of the study of medicinal plants.
Section 2. Basics of Botany	Topic 2.1. Basic concepts and definitions of botany. - Sections and tasks of botany; directions, methods and basic concepts of botany.
	Topic 2.2. General characteristics of lower and higher plants: - The main features of higher plants
Section 3. Plant morphology	Topic 3.1. Root: concept, structure and functions. - The functions of the root; - Differentiation of the roots; - metamorphosis of the root.
	Topic 3.2. The shoot as a single organ: - the concept of the shoot and its functions; - types of shoots; morphology of the shoot (nodes, internodes); - metamorphosis of the shoot.
	Topic 3.3. Leaf. - morphological structure and functions of the leaf; - classification of leaves; types of leaf veins; - leaf metamorphosis.
Section 4. Plant systematics	Topic 4.1. Plant systematics as a science. - The concept of species in plants; - The system of botanical taxonomic categories; - lower and higher plants.
	Topic 4.2. Algae. Classification. The importance of algae in nature. Algae used in pharmaceutical, food industry, animal feed production.
	Topic 4.3. Higher spore plants. Medicinal and poisonous plants of the divisions: Plaunaceae, Cattailaceae, Fernaceae.
	Topic 4.4. Division of Holosemens. Medicinal and poisonous plants.
	Topic 4.5. Division of Cloversperms. - Division of flowering plants into classes. Comparative

	<p>characteristics of monocotyledonous and dicotyledonous classes.</p> <p>Topic 4.6. Families of flowering plants. General characteristics of each family. Medicinal and poisonous plants of the families:</p> <ul style="list-style-type: none"> - Buttercups (Ranunculaceae); - Rosaceae; - Legumes (Fabaceae); - Lamiaceae; - Celery (Apiaceae); - Solanaceae; - Asteraceae; - Liliaceae; - Poaceae.
Section 5. Medicinal plants.	<p>Topic 5.1. General information about medicinal plants, their botanical characteristics.</p> <p>Topic 5.2. Physical, chemical and biological properties of biologically active substances.</p> <p>Topic 5.3. The content of the main biologically active substances in medicinal plants, the effect on the animal body;</p> <p>Topic 5.4. Technology of preparation and drying of raw materials and its chemical composition;</p> <p>Topic 5.5. Applications in medicine and veterinary medicine based on the latest achievements of science.</p>
Section 6. Poisonous Plants.	<p>Topic 6.1. General information about poisonous plants, their botanical characteristics. Prevention of poisoning.</p> <p>Theme 6.2 Main signs of poisoning by poisonous plants; - Ways to provide first aid in case of poisoning by poisonous plants;</p> <p>Topic 6.3. poisonous plants for mammals; poisonous plants for bees and hydrobionts; plants that give poisonous properties to honey, milk and other animal products.</p>

Course title	Fodder Plants
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Fundamentals of Botany	<p>Topic 1.1. Basic concepts and definitions of botany.</p> <ul style="list-style-type: none"> - Sections and tasks of botany; directions, methods and basic concepts of botany. <p>Theme 1.2 General characteristics of lower and higher plants:</p>

	<ul style="list-style-type: none"> - the main features of higher plants, - the importance of plants in nature and human life; - protection of the plant world.
Section 2. Plant Morphology	<p>Topic 2.1. Root: concept, structure and functions.</p> <ul style="list-style-type: none"> - Root functions; root differentiation; root metamorphosis.
	<p>Topic 2.2. The shoot as a single organ:</p> <ul style="list-style-type: none"> - the concept of the shoot and its functions; - types of shoots; morphology of the shoot (nodes, internodes); - metamorphosis of the shoot.
	<p>Topic 2.3. Leaf.</p> <ul style="list-style-type: none"> - morphological structure and functions of the leaf; - classification of leaves; types of leaf veins; - leaf metamorphosis.
Section 3. Plant systematics	<p>Topic 3.1. Plant systematics as a science.</p> <ul style="list-style-type: none"> - The concept of species in plants; - phylogenetic systems of the plant world; - system of botanical taxonomic categories;
	<p>Topic 3.2. Division of the division of flowering plants into classes. Comparative characteristics of monocotyledonous and dicotyledonous classes.</p> <ul style="list-style-type: none"> - Characteristics of families on the example of major medicinal and fodder plants.
Section 4. Fodder plants.	<p>Theme 4.1 General information about forage plants, their botanical characteristics.</p> <ul style="list-style-type: none"> - The content of the main biologically active substances in forage plants and their effect on the body of animals.
	<p>Topic 4.2 General information about poisonous plants, their botanical characteristics. Prevention of poisoning.</p> <ul style="list-style-type: none"> - The main signs of poisoning by poisonous plants; - methods of first aid in case of poisoning by poisonous plants.

Course title	Basics of Professional Ethics
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Ethics of Interethnic Communication and Specifics of Work in International Teams	<p>Topic 1.1 Ethics of interethnic communication as a high degree of perfection and development of relations, manifested in the interethnic and spiritual ties of different peoples.</p> <p>The concept of tolerance. Specifics of work in an international team. Study of the specific features of different cultures and peoples. Introduction to theories of civilization.</p> <p>Patriotism as a moral and political principle.</p> <p>Friendship of peoples as a moral value, social and cultural</p>

	<p>reality. Friendship of Peoples as a moral and cultural priority at PFUR.</p> <p>Main provisions of the PFUR teacher's Code of honor.</p> <p>Main Provisions of the PFUR Student Honor Code.</p>
Section 2. Ethics as a philosophical science.	<p>Topic 2.1. Ethics as the science of morality. Subject matter, structure and functions of ethics. Ethics in the structure of philosophical knowledge. Ethics, morality, morality. Foundations of morality. Moral values of man in basic categories of ethics. Modern problems of ethics.</p>
Section 3. History of Ethical Teaching.	<p>Topic 3.1. The main schools of ethical knowledge. Ethical thought from Antiquity to modern society. Historical formation of professional ethics.</p>
Section 4. Professional Ethics and its Relationship to General Moral Theory.	<p>Topic 4.1 Applied ethics and professional ethics. Functions and structure of professional ethics. Professional morality as an object of study of professional ethics. Moral value of work. Professionalism as a moral characteristic of a person.</p>
Section 5. Professional Ethics in Different Spheres of Human Employment/ The Importance of Codes of Ethics in Modern Society.	<p>Topic 5.1 The concept of profession. The role of professional activity in modern society. The place of the code of ethics in professional activity. Professional aptitude and professional deformation of personality. Codes of conduct for specialists in different spheres of professional activity.</p>

Course title	Zoopsychology
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Introduction to Zoopsychology.	Topic 1.1. Discipline is a system of knowledge about the laws of functioning of the psyche of animals.
Section 2. General characteristics of the learning process.	Topic 2.1. Characteristics of mental reflection at the lowest level of the elementary sensory psyche.
	Topic 2.2. Locomotor activity and spatial orientation in protozoa.
	Topic 2.3. The problem of behavior plasticity.
	Topic 2.4. The phenomenon of addiction.
	Topic 2.5. Mental reflection at the highest level of the elementary sensory psyche.
	Topic 2.6. The emergence of the nervous system.
	Topic 2.7. Locomotor activity of lower invertebrates.
	Topic 2.8. The rudiments of higher forms of behavior.
Section 3. Levels of development of the psyche.	Topic 3.1. Characteristics of the psyche of animals at the lowest and highest levels of the perceptual psyche.

	Topic 3.2. Motor and sensory abilities of higher invertebrates.
	Topic 3.3. Plasticity of behavior of higher vertebrates as a result of development of complex skills.
Section 4. Animal communication.	Topic 4.1. Biological interaction as the basis for the origin of communication in the process of evolution.
	Topic 4.2. Types of communication in animals.
	Topic 4.3. Demonstrative behavior and ritualization.
	Topic 4.4. The origin of intention movements and their role.
	Topic 4.5. "Autochthonous" and "allochthonous" movements.
Section 5. Juvenile period of development of the psyche.	Topic 5.1. Congenital and acquired in individual development of behavior.
	Topic 5.2. Biological conditioning of ontogenesis of animal behavior.
	Topic 5.3. "Embryonic learning" and maturation.
	Topic 5.4. Development of motor activity and sensory abilities.
	Topic 5.5. Prenatal development of the elements of communication.
	Topic 5.6. Types and characteristics of psychosomatic disorders in animals.
Section 6. Psychosomatic disorders in animals.	Topic 6. Peculiarities of psychology characteristic of individual animal species.
Section 7. Private zoopsychology.	Topic 7. Peculiarities of psychology characteristic of individual animal species.

Course title	Здоровье и благополучие животных
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Раздел 1. Общая гигиена	Тема 1.1. Гигиена воздушной среды.
	Тема 1.2. Гигиена микроклимата.
	Тема 1.3. Гигиена почвы.
	Тема 1.4. Гигиена водоснабжения.
	Тема 1.5. Гигиена кормов.
	Тема 1.6. Содержание животных.
	Тема 1.7. Гигиена пастбищного содержания, транспортировки животных и сырья.
	Тема 1.8. Гигиена животноводческих объектов.

	Тема 1.9. Гигиена санитарно-технического оборудования.
	Тема 1.10. Личная гигиена сотрудников, работающих с животными.
	Тема 1.11. Гигиена окружающей среды.
Раздел 2. Частная гигиена	Тема 2.1. Гигиена КРС.
	Тема 2.2. Гигиена свиней и МРС.
	Тема 2.3. Гигиена лошадей.
	Тема 2.4. Гигиена сельскохозяйственной птицы.

Course title	Laboratory Diagnostics
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Introduction.	Topic 1.1 Objects and methods of laboratory research.
Section 2. Blood testing.	Topic 2.1. Rules for collecting material from different types of animals.
	Topic 2.2. Principles of construction of the scheme and algorithm of research.
	Topic 2.3 General clinical blood test.
	Topic 2.4. General principles of calculus of shaped blood elements. Counting red blood cells.
	Topic 2.5. White blood cell count. Elimination of the leukocyte formula.
	Topic 2.6. Methods for determining hemoglobin.
	Topic 2.7. Obtaining defibrinated blood plasma, serum.
	Topic 2.8. Determination of erythrocyte sedimentation rate (ESR).
Section 3. Laboratory diagnostics of the isolation system. Urine analysis.	Topic 3.1. Biochemical blood analysis.
	Topic 3.2. Rules for collecting material from different types of animals.
	Topic 3.3. Principles of construction of the scheme and algorithm of research.
	Topic 3.4. Investigation of kidney functions, physico-chemical properties of urine.
	Topic 3.5. General clinical analysis of urine.
	Topic 3.6. Biochemical analysis of urine.
	Topic 3.7. Preparation of a smear.
Section 4. Laboratory diagnostics of the endocrine system.	Topic 4.1. Microscopy of urinary sediment. Uroliths.

Section 5. Laboratory diagnostics of the respiratory system.	Topic 5.1 Diagnosis of pathology of the endocrine glands (biochemical blood analysis).
	Topic 5.2. Principles of sampling of punctate and biopsy.
Section 6. Laboratory diagnostics of the digestive system.	Topic 6.1. Laboratory examination of the material.
	Topic 6.2 Determination of the enzymatic activity of saliva.
	Topic 6.3 Study of gastric secretion.
	Topic 6.4 Determination of acidity and enzymatic activity of gastric juice.

Course title	Laboratory Diagnostics of Infectious and Invasive Diseases
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Introduction	Topic 1.1. Objects and methods of laboratory research.
Section 2. Blood testing	Topic 2.1. Rules for collecting material from different types of animals.
	Topic 2.2. Principles of construction of the scheme and algorithm of research. General clinical blood test.
	Topic 2.3. General principles of calculus of shaped blood elements. Counting red blood cells.
	Topic 2.4. White blood cell count. Elimination of the leukocyte formula.
	Topic 2.5. Methods for determining hemoglobin.
	Topic 2.6. Obtaining defibrinated blood plasma, serum.
	Topic 2.7. Determination of erythrocyte sedimentation rate (ESR).
	Topic 2.8. Biochemical blood analysis.
Section 3. Laboratory diagnostics of the isolation system. Urine analysis.	Topic 3.1. Rules for collecting material from different types of animals.
	Topic 3.2. Principles of construction of the scheme and algorithm of research.
	Topic 3.3. Research of kidney functions, physico-chemical properties of urine.
	Topic 3.4. General clinical analysis of urine.
	Topic 3.5. Biochemical analysis of urine.
	Topic 3.6. Preparation of a smear.
	Topic 3.7. Microscopy of urinary sediment. Uroliths.
Section 4. Laboratory	Topic 4.1. Diagnosis of pathology of the endocrine glands

diagnostics of the endocrine system.	(biochemical blood analysis).
Section 5. Laboratory diagnostics of the respiratory system.	Topic 5.1. Principles of sampling of punctate and biopsy.
	Topic 5.2. Laboratory examination of the material.
Section 6. Laboratory diagnostics of the digestive system.	Topic 6.1. Determination of the enzymatic activity of saliva.
	Topic 6.2. Study of gastric secretion.
	Topic 6.3. Determination of acidity and enzymatic activity of gastric juice.
	Topic 6.4. Coprology. Rules of sampling and laboratory examination of feces.

Course title	Organization of State Veterinary Supervision
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Legislative bases of regulation of state veterinary control/supervision	Topic 1.1. State veterinary control at the modern level
	Topic 1.2. Mandatory measures in the field of veterinary medicine
Section 2. State veterinary control/supervision at facilities related to the production and sale of controlled goods	Topic 2.1 State veterinary control at facilities for breeding and rearing farm animals (cattle, sheep, pigs, horses)
	Topic 2.2 State veterinary control at poultry breeding and rearing facilities
	Topic 2.3. State veterinary control at fur-bearing animals/rabbits breeding facilities
	Topic 2.4. State veterinary control at the facilities for the slaughter of animals and processing of slaughter products
	Topic 2.5. State veterinary control at facilities for the maintenance of honey bees and the production of bee products
	Topic 2.6. State veterinary control at artificially created fish breeding facilities
	Topic 2.7. State veterinary control over the circulation of feed in the territory of the Russian Federation
	Topic 2.8. State veterinary control on transport
Section 3. State supervision in the field of production and circulation of medicines for veterinary use	Topic 3.1. State supervision of the production of medicines for veterinary use
	Topic 3.2. Handling and quality control of biological preparations for veterinary use on the territory of the CU
	Topic 3.3. State registration of products for veterinary use in the territory of the Russian Federation
	Topic 3.4. Certification of medicines for veterinary use in the territory of the Russian Federation.

	Topic 3.5. Organization and procedure of storage of narcotic drugs, psychotropic substances and their precursors, potent and poisonous substances for veterinary use.
	Topic 3.6. Organization and implementation of state supervision in terms of entities engaged in the trade of medicines for veterinary use.
Section 4. State veterinary supervision at animal welfare facilities (zoos, circuses).	Topic 4.1. Organization and procedure of state veterinary supervision at animal welfare facilities (zoos, circuses).

Course title	Veterinary and Industrial Laboratories with design basics
Course workload, CU/ac.h.	2/72
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Planning and placement of veterinary laboratories. Equipment sheet.	Topic 1.1. Standards GOST, TU, SanPiN, NTP APK and others for laboratories of veterinary and sanitary examination. The norms of the RD APK. Recommendations for the design and operation of veterinary laboratories. SanPiN 2.2.1 2.1.1.1200-03 Sanitary protection zones and sanitary classification of enterprises, structures and other facilities.
Section 2. Working with laboratory animals.	Topic 2.1. Sanitary and epidemiological requirements for the device, equipment and maintenance of EBC (vivariums). Veterinary and sanitary rules for keeping and using laboratory animals.
Section 3. Safety precautions when working in laboratories. Sample selection.	Topic 3.1. SP 1.3.3118-13 Safety of work with microorganisms of I - II groups of pathogenicity (danger). SP 1.3.2322-08 Safety of work with microorganisms of III-IV pathogenicity groups SP 2.6.1.2612-10 Basic sanitary rules for ensuring radiation safety PND F 12.13.1-03 Methodical recommendations. Safety precautions when working in analytical laboratories general provisions. Safety precautions for disinfection in laboratories of veterinary and sanitary examination. Rules for working with samples.
Section 4. Accreditation of testing laboratories.	Topic 4.1. Federal Law of 28.12.2013 N 412-FZ rev. from 03/02/2016 About accreditation in the national accreditation system. GOST R 51000.4-2011. National standard of the Russian Federation. General requirements for the accreditation of testing laboratories. GOST ISO IEC 17025-2009. Interstate standard. General requirements for the competence of testing and calibration laboratories. GOST 33044-2014 OECD GLP Good Laboratory Practice Principles.

Section 5. Production laboratory of veterinary and sanitary examination at the enterprise.	Topic 5.1. Placement of laboratories. Laboratory structure. Veterinary and sanitary requirements for the premises and equipment of the production laboratory for veterinary and sanitary examination. Tasks and functions of the production laboratory for veterinary and sanitary examination. Responsibilities of the specialists of the production laboratory of veterinary and sanitary examination.
Section 6. State Laboratory of Veterinary and Sanitary Expertise (SLVSE) in the food market.	Topic 6.1. Regulations on the state laboratory of veterinary and sanitary examination in food markets. Tasks and functions of SLVSE. SLVSE structure. Job responsibilities of employees of SLVSE. Basic regulations for SLVSE workers in food markets. Mobile laboratory for veterinary and sanitary examination for fairs and agricultural exhibitions.

Course title	Biometrics in Veterinary Medicine
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Biological experiment and mathematical method	Topic 1.1. Modern statistical systems: domestic and foreign.
Section 2. Descriptive statistics	Topic 2.1. Calculation of the main characteristics of sample populations.
	Topic 2.2. Confidence probability.
	Topic 2.3. Confidence limits of the general average.
	Topic 2.4. Student's criterion.
	Topic 2.5. Estimation of the difference between sample averages, between sample shares.
Section 3. Mathematical analysis of experimental data	Topic 3.1. Correlation analysis.
	Topic 3.2. Regression analysis.
	Topic 3.3. Calculation of the data of factorial experiments by the method of analysis of variance.
Section 4. Experiment organization methods	Topic 4.1. Experiment planning and methodology

Course title	Career Management
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Theoretical and methodological issues of	Topic 1.1 Business career as a socio-economic category.
	Topic 1.2 Life plans and career.

business career management	Topic 1.3. The main characteristics of the concept of "business career management".
Section 2. Practical activity in the organization for the management of career processes	Topic 2.1. Personnel management and career processes in the organization.
	Topic 2.2. Attracting, selecting and hiring new employees.
	Topic 2.3. Planning of career processes in the organization.
	Topic 2.4. Evaluation of works and employees.
Section 3. Practical recommendations for individual career management	Topic 3.1. Career goals and career planning
	Topic 3.2. Self-assessment from a career perspective. Professional orientation and choice of profession.
	Topic 3.3. Organization and regulation of individual career
Section 4. Specifics of career management of certain categories of employees	Topic 4.1. Features of career management of managers (executives) and young professionals.
	Topic 4.2. Specifics of career management of young professionals.

Course title	Basics of Social and Legal Knowledge
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Fundamentals of the Social State.	Topic 1.1. The concept, characteristics, goals and objectives, and principles of the social state. Models of the social state. Social policy. Subjects of social policy.
Section 2. Fundamentals of Public Welfare.	Topic 2.1. The concept of social protection, social assistance, social support and social guarantees. The ratio of the basic concepts. The role of the state in the realization of the right to social security and social protection. State social security: organization and financing. Subjects. Rights and obligations of recipients of social services. The place of social security law in the general system of current legislation. Constitutional guarantees of the right of citizens to social security in Russia. Federal laws regulating social security of the population. Subsidiary normative-legal acts. The legislation of the subjects. International sources.
Section 3. Mandatory Health Insurance.	Topic 3.1. The concept of compulsory health insurance. Organization of compulsory health insurance in the Russian Federation. The procedure for providing insurance coverage.
Section 4. Insurance coverage in connection with accidents at work and occupational diseases.	Topic 4.1. General characteristics of compulsory social insurance against accidents at work and occupational diseases. Rights and responsibilities of insured persons. Grounds for providing insurance cover. Reimbursement of additional rehabilitation costs.
Section 5. State pensions.	Topic 5.1. The system of state pension provision. Pension security of federal civil servants. The concept and types of insurance periods. Special (professional) length of service. Length of service. Confirmation of seniority.

Section 6. International Social Security Law.	Topic 6.1. General characteristics of social security law. History of international social security law. Basic standards of the International Labor Organization in the field of social security. Regional standards of social security.
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Course title	Space Technologies in the Service of the Agro-Industrial Complex
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. The device of space and the Earth.	Topic 1.1. Space missions to explore the Solar System - challenges and opportunities.
	Topic 1.2. Implemented and planned projects for the study of the Solar System.
	Topic 1.3. Space missions for the exploration of the Sun - tasks, features and limitations.
	Topic 1.4. Orbital missions for the exploration of distant space.
Section 2. Space technology.	Topic 2.1. Technique, apparatus and various devices used in outer space.
	Topic 2.2. Areas of activity on Earth that rely on data from spacecraft and devices.
	Topic 2.3. Space technology used in the agro-industrial complex.

Course title	Horse Diseases
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Introduction. Morphofunctional features of ungulates	Topic 1.1. Introduction to equestrian veterinary medicine.
	Topic 1.2 Fundamentals of anatomy and physiology of horses
Section 2. Pathological processes of the gastrointestinal tract	Topic 2.1. Pathology of the oral cavity.
	Topic 2.2. Diseases of the stomach and intestines.
	Topic 2.3 The essence of colic syndrome
Section 3. Pathology of the musculoskeletal system.	Topic 3.1. Bursitis
	Topic 3.2. Arthritis
	Topic 3.3. Tendovaginitis.
	Topic 3.4. Laminates
Section 4. Diseases of the maxillofacial and respiratory organs	Topic 4.1. Maxillofacial pathology.
	Topic 4.2. Diseases of the nasal sinuses and teeth.
	Topic 4.3. Ophthalmology.
	Topic 4.4. Pathology of the respiratory apparatus

Section 5. Diagnostic measures for various pathology of horses	Topic 5.1. Additional and special research methods.
	Topic 5.2. Documentation for animal management. Medical history.

Course title	Diseases of Productive Animals
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Differential diagnosis of diseases of productive animals.	Topic 1.1. Methods of working with animal owners.
	Topic 1.2. Algorithm of differential diagnosis in various diseases.
	Topic 1.3. Urgent conditions and planned diagnostics.
	Topic 1.4. Medical examination.
Section 2. Diseases of the gastrointestinal tract.	Topic 2.1. Methods of diagnosis of chronic and urgent gastrointestinal pathologies.
	Topic 2.2. Palpation, percussion and auscultation of abdominal organs.
	Topic 2.3. Radiography and ultrasound examination of the abdominal cavity.
	Topic 2.4. Operative and conservative treatment of patients.
	Topic 2.5. Rehabilitation.
Section 3. Investigation of pathologies and development of a therapeutic diet.	Topic 3.1 Methods of investigation of the patient in the pathology of the digestive glands. The coprogram.
	Topic 3.2. Development of therapeutic diets.
Section 4. Diseases of the urinary tract.	Topic 4.1. Algorithm of differential diagnosis of diseases of the urinary system.
	Topic 4.2. Nephritis, nephrosis, nephrosclerosis, pyelonephritis.
	Topic 4.3. Diseases of the urinary tract: pyelitis, urocystitis, urolithiasis.
	Topic 4.4. Hematuria. Urine examination, ultrasound and X-ray diagnostics. Cystocentesis.
Section 5. Pathology of the reproductive system	Topic 5.1. Differential diagnosis of diseases of the genitals.
	Topic 5.2. Ultrasound and X-ray diagnostics of diseases of the genital organs.
	Topic 5.3. Operative and conservative treatment.
	Topic 5.4. Endometritis. The pyometer. Vulvovaginitis.
	Topic 5.5. Ovarian cysts.
	Topic 5.6. Prostatitis. Neoplasms of the prostate.
Section 6. Pathology of the respiratory tract.	Topic 6.1. Examination of the respiratory system.

	Topic 6.2. Auscultation of the respiratory tract.
	Topic 6.3. Chest X-ray.
	Topic 6.4. Thoracocentesis.
Section 7. Pathology of the cardiovascular system.	Topic 7.1. Diseases of the cardiovascular system.
	Topic 7.2. Classification, syndromes.
	Topic 7.3. Diseases of the heart muscle.
	Topic 7.4. Endocardial diseases.
	Topic 7.5. Heart defects.
	Topic 7.6. Vascular diseases.
Section 8. Infectious diseases of productive animals.	Topic 8.1. Methods of diagnosis and prevention.
	Topic 8.2. Working out the method of admission of a patient with suspected infectious pathology.
	Topic 8.3. Algorithm of differential diagnostics.
	Topic 8.4. Etiotropic therapy.
	Topic 8.5. Symptomatic treatment.
Section 9. Endocrinological pathology. Diagnostic methods and correction.	Topic 9.1. Algorithm of differential diagnosis of endocrinological pathology.
	Topic 9.2. Trichoscopy, analysis of the results of scotch tests and scrapings.
	Topic 9.3. Blood and urine testing.

Course title	Communicative Workshop
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Life activity of a biological organism and its characteristics	Topic 1.1. Types of process mechanisms. The emergence of a new object and its demise. Formation of objects. Disappearance of objects.
	Topic 1.2 Changes in the location of the object: the motion of a fluid. Fluid motion. The nature and direction of motion.
	Topic 1.3 Changing the dynamics of the process. Process disruption and termination. Process disruption. Process termination.
	Topic 1.4. The role of the process. Evaluation of the process in terms of importance, significance. Process evaluation in terms of benefit/harm.

Course title	Small Animal Diseases
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Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1 Introduction.	Topic 1.1. The discipline is a system of knowledge about diseases of small domestic animals.
Section 2. Differential diagnosis of diseases of Small Pets.	Topic 2.1. Methods of working with animal owners.
	Topic 2.2. Algorithm of differential diagnosis in various diseases.
	Topic 2.3. Urgent conditions and planned diagnostics.
	Topic 2.4. Medical examination of Small Pets.
Section 3. Diseases of the gastrointestinal tract	Topic 3.1. Methods of diagnosis of chronic and urgent gastrointestinal pathologies.
	Topic 3.2. Palpation, percussion and auscultation of abdominal organs
	Topic 3.3. Radiography and ultrasound examination of the abdominal cavity.
	Topic 3.4. Operative and conservative treatment of patients.
	Topic 3.5. Rehabilitation.
Section 4. Diseases of the liver, gallbladder and pancreas.	Topic 4.1. Methods of examination of the patient in the pathology of the digestive glands. The coprogram.
	Topic 4.2. Development of therapeutic diets.
Section 5. Diseases of the urinary system.	Topic 5.1. Algorithm of differential diagnosis of diseases of the urinary system.
	Topic 5.2. Nephritis, nephrosis, nephrosclerosis, pyelonephritis.
	Topic 5.3. Diseases of the urinary tract: pyelitis, urocystitis, urolithiasis.
	Topic 5.4. Hematuria. Urine examination, ultrasound and X-ray diagnostics. Cystocentesis.
Section 6. Diseases of the genitals of small pets	Topic 6.1. Differential diagnosis of diseases of the genitals.
	Topic 6.2. Ultrasound and X-ray diagnostics of diseases of the genital organs.
	Topic 6.3. Operative and conservative treatment.

	Topic 6.4. Endometritis. The pyometer. Vulvovaginitis.
	Topic 6.5. Ovarian cysts.
	Topic 6.6. Prostatitis.
Section 7. Features of diseases of the respiratory organs of small animals.	Topic 7.1. Examination of the respiratory system.
	Topic 7.2. Auscultation of the respiratory tract.
	Topic 7.3. Chest X-ray.
	Topic 7.4. Thoracocentesis.
Section 8. Features of diseases of the cardiovascular system.	Topic 8.1. Diseases of the cardiovascular system.
	Topic 8.2. Classification, syndromes.
	Topic 8.3. Diseases of the heart muscle.
	Topic 8.4. Endocardial diseases.
	Topic 8.5. Heart defects.
	Topic 8.6. Vascular diseases
Section 9. Infectious diseases of Small Pets. Methods of diagnosis and prevention	Topic 9.1. Methods of diagnosis and prevention.
	Topic 9.2. Working out the method of admission of a patient with suspected infectious pathology.
	Topic 9.3. Algorithm of differential diagnostics.
	Topic 9.4. Etiotropic therapy.
	Topic 9.5. Symptomatic treatment.
Section 10. Endocrinological pathologies. Diagnostic methods and correction.	Topic 10.1. Algorithm of differential diagnosis of endocrinological pathologies.
	Topic 10.2. Trichoscopy, analysis of the results of scotch tests and scrapings.
	Topic 10.3. Blood and urine testing.
Section 11. Urgent states in everyday practice.	Topic 11.1. X-ray and ultrasound examinations of patients.
	Topic 11.2. Analysis of radiographs, tomograms, test results and ultrasound protocols.
	Topic 11.3. Development of intensive care algorithms.

Course title	Diseases of Bees and Entomophages
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. General regulatory documents on bee diseases	Topic 1.1 General regulatory documents on bee diseases.
	Topic 1.2 Significance for the State.
Section 2. Bee products	Topic 2.1 Propolis.
	Topic 2.2 Wax.
	Topic 2.3 Bee royal jelly.
	Topic 2.4 Bee venom.
	Topic 2.5 Drone homogenate.
Section 3. Biology of the bee family	Topic 3.1 Bee breeds.
	Topic 3.2 The bee family.
	Topic 3.3 Development of the worker bee, queen bee and drone.
Section 4. Bee Virosis	Topic 4.1 Baggy brood;
	Topic 4.2 Chronic viral paralysis
	Topic 4.3 Acute paralysis of bees; filamentovirosis
	Topic 4.4 Iridescensvirosis
	Topic 4.5 Disease "black queen bee"
	Topic 4.6 Disease "darkened (cloudy) wing"
	Topic 4.7 Other viros.
Section 5. Bacterioses and mycoses of bees	Topic 5.1 American Rotten
	Topic 5.2 European rotten
	Topic 5.3 Paragnilets
	Topic 5.4 Powdery brood
	Topic 5.5 Bee septimation
	Topic 5.6 Gafniosis
	Topic 5.7 Other bacterioses.
Section 6. Invasive bee diseases	Topic 6.1 Varroosis, other diseases
Section 7. Non-infectious diseases of bees	Topic 7.1 Carbohydrate starvation.
	Topic 7.2 Protein starvation.
	Topic 7.3 Case toxicosis.
	Topic 7.4 Chemical toxicosis.

	Topic 7.5 Genetic lethality.
	Topic 7.6 Frozen brood.
Section 8. Veterinary and sanitary measures at the apiary	Topic 8.1 Basic preventive measures.
Section 9. Regulatory documents on bee diseases	Topic 9.1 Regulatory documents on bee diseases.

Course title	Fish Pathology and Aquaculture
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. General regulatory documents on fish diseases	Topic 1.1 General regulatory documents on fish diseases.
	Topic 1.2 Significance for the State.
Section 2. Viral diseases of fish	Topic 2.1 Fish vibriosis.
	Topic 2.2 Spring viremia of carp (VVC).
Section 3. Bacterial diseases of fish	Topic 3.1 Infectious necrosis of hematopoietic tissue of salmon.
	Topic 3.2 Infectious necrosis of the salmon pancreas (VHS).
Section 4. Mycoses of fish	Topic 4.1 Viral hemorrhagic septicemia of salmon.
	Topic 4.2 Infectious anemia of salmon.
Section 5. Protozoal diseases of fish	Topic 5.1 Inflammation of the carp swim bladder (RUNWAY).
	Topic 5.2 Smallpox (papillomatosis, epithelioma) of carp.
Section 6. Helminthiasis of fish. Monogenoidosis. Cestodoses	Topic 6.1 Aeromonosis.
	Topic 6.2 Bacterial renal disease of salmon.
Section 7. Helminthiasis of fish. Trematodoses. Nematodes	Topic 7.1 Yersiniosis.
	Topic 7.2 Myxobacterioses.
Section 8. Crustaceoses and other parasitoses	Topic 8.1 Pseudomonosis.
Section 9. Non-communicable	Topic 9.1 Saprolegniosis.

diseases of fish	Topic 9.2 Furunculosis.
	Topic 9.3 Erythrodermatitis.
Section 10. Veterinary-sanitary and preventive measures at fish farms.	Topic 10.1 Branchiomycosis. Deep mycosis.

Course title	Diseases of Exotic Animals
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Rodents	Topic 1.1. Infectious diseases, parasitic diseases and worm infestations in representatives of the rodent order.
Section 2. Amphibians	Topic 2.1. Endoparasites, dermatitis, pneumonia, kidney diseases in representatives of the amphibian class.
Section 3. Reptiles	Topic 3.1. Stomatitis, gout, tumors, heat stroke and intestinal infections in representatives of the reptile class.
Section 4. Primates	Topic 4.1. Viral infections, pneumonia, parasitic infections and helminthiasis in representatives of the order primates.

Course title	Anesthesiology, resuscitation and intensive care
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. General concepts of anesthesiology, intensive care and intensive care.	Topic 1.1. General concepts of anesthesiology, intensive care and intensive care.
	Topic 1.2. Legal issues.
	Topic 1.3. Intraoperative patient monitoring.
Section 2. Methods, pharmacological means and techniques of analgesia, premedication and anesthetic support.	Topic 2.1. Types and stages of anesthesia.
	Topic 2.2. Inhalation anesthesia.
	Topic 2.3. Local anesthesia.
	Topic 2.4. Infusion therapy.
	Topic 2.5. Acute blood loss.
	Topic 2.6. Cardiopulmonary resuscitation.
Section 3. Anesthesia of particularly difficult patients.	Topic 3.1. Anesthesiology of diabetics.
	Topic 3.2. Anesthesiology in ophthalmology.
	Topic 3.3. Anesthesiology of exotic animals.
	Topic 3.4. Anesthesiology in neurology.

	Topic 3.5. Physiology of CPP, IP.
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Course title	Dermatology
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Introduction to Dermatology	Topic 1.1 Methods of skin research
	Topic 1.2 Bacterial skin diseases: furunculosis of the back of the nose, pyoderma of the skin folds, dermatitis, etc., as well as their methods of treatment.
Section 2. Superficial mycoses and immunological skin diseases that are complicated by bacterial infection.	Topic 2.1. Superficial mycoses, candidiasis, malassesiosis and treatments.
	Topic 2.2. Immunological dermatitis complicated by bacterial infection: autoimmune, psychogenic, allergic.

Course title	Cardiology
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Introduction to Cardiology	Topic 1.1 Blood supply to the heart, research of the cardiovascular system.
	Topic 1.2 Examination, auscultation, percussion, palpation, X-ray examinations.
Section 2. Diagnosis of diseases of the cardiovascular system	Topic 2.1. Acute heart failure, ECG recording technique.
	Topic 2.2. Echocardiography, ultrasound cardiography, phonocardiography.

Course title	Endocrinology
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Introduction to endocrinology.	Topic 1.1. General characteristics of the endocrine glands. Hormones and their role in the body.
	Topic 1.2. Diagnosis of endocrine diseases. Laboratory and instrumental methods of diagnostics of endocrine diseases.
Section 2. Private endocrinology.	Topic 2.1. Diseases of the pancreatic insular apparatus
	Topic 2.2. Diseases of the hypothalamic pituitary system. Diseases of the adrenal glands.
	Topic 2.3. Diseases of the parathyroid gland. Reproductive endocrinology.

Course title	Nephrology
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. General issues of nephrology.	Topic 1.1. Functional morphology of the kidneys. Semiotics of kidney diseases. Assessment of the functional state of the kidneys.
Section 2. Kidney diseases.	Topic 2.1. Glomerulonephritis, pyelonephritis, kidney damage in metabolic diseases.
	Topic 2.2. Secondary nephropathies, congenital and hereditary nephropathies.

Course title	Reconstructive surgery
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Traumatology and orthopedics.	Topic 1.1 Classification of fractures.
	Topic 1.2 Osteosynthesis.
	Topic 1.3 Arthrodesis. Corrective osteotomy.
Section 2. Thoracic and abdominal surgery.	Topic 2.1 Thoracic reconstructive surgery.
	Topic 2.2 Abdominal reconstructive surgery.
Section 3. Operations in the head and neck.	Topic 3.1 Reconstructive and reconstructive surgery of the facial part of the skull.
	Topic 3.2 Reconstructive and reconstructive surgery of the cerebral part of the skull.
	Topic 3.3 Reconstructive and reconstructive surgery in the neck.
Section 4. Neurosurgery.	Topic 4.1 Methods of surgical treatment for injuries of the central and peripheral nervous system.
Section 5. Plastic surgery.	Topic 5.1 Soft tissue surgery.
	Topic 5.2 Plastic surgery in oncology.
	Topic 5.3 Skin plastic surgery.

Course title	Veterinary ophthalmology
Course workload, CU/ac.h.	3/108

CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. General concepts and methods of operative surgery.	Topic 1.1 General concepts of operative surgery, (surgical clinic, surgical manipulations, surgical operation).
	Topic 1.2 Fixation of animals, anesthesia, local anesthesia.
	Topic 1.3 Surgical instruments.
	Topic 1.4 Methods of asepsis and antiseptics in operative surgery.
	Topic 1.5. Separation of tissues. Bleeding, types, methods of stopping.
	Topic 1.6. General principles of surgical suture application.
	Topic 1.7. Desmurgy.
Section 2. Methods and features of surgical operations.	Topic 2.1. Operational access.
	Topic 2.2. Operational techniques, types, methods, features.
	Topic 2.3. Features of oncological operations. Principles of ablasy.
	Topic 2.4. Connection of soft tissues. The final stage of the operation.
	Topic 2.5. The connection of dense fabrics. Osteosynthesis.

Course title	Animal Dentistry
Course workload, CU/ac.h.	3/108
CONTENT OF THE DISCIPLINE	
Sections	Topics
Section 1. Dentistry.	Topic 1.1 Anatomical and topographic characteristics of the oral cavity of animals.
	Topic 1.2 The device and equipment of a dental office in veterinary medicine. Tools.
	Topic 1.3 Organization of veterinary dental work.
	Topic 1.4 Timing of eruption and erasure of teeth in animals.
	Topic 1.5 Structural features of the dental apparatus in different animal species.
	Topic 1.6 Anomalies of dental bite and tooth erasure.
	Topic 1.7 Dental diseases of non-carious origin.
	Topic 1.8 Dental diseases of non-carious origin.
	Topic 1.9 General principles of surgical treatment of the dental system of animals.

The course instruction is implemented within the professional education programme of higher education: “Veterinary Medicine”

Recommended by the Didactic Council for the Education Field of:
36.05.01 Veterinary Medicine

Name of the discipline	“Service-learning”	
Course Workload, credits/ac.h.	2/72	
COURSE CONTENTS		
Course module title	Course module contents (topics)	
Module 1. Introduction to social project design.	1.1	Reflection.
	1.2	Survey.
Module 2. Analysis of the situation and problem definition.	2.1	Reflection.
	2.2	Self-assessment.
	2.3	Peer assessment.
	2.4	Supervisor assessment.
Module 3. Development of a hypothesis for project solution.	3.1	Reflection.
	3.2	Self-assessment.
	3.3	Peer assessment.
	3.4	Supervisor assessment.
Module 4. Development and defense of the project passport.	4.1	Defense of the project passport.
	4.2	Reflection.
	4.3	Self-assessment.
	4.4	Peer assessment.
	4.5	Supervisor assessment.
	4.6	Community assessment.
Module 5. Implementation of a public project.	5.1	Self-assessment.
	5.2	Peer assessment.
	5.3	Supervisor assessment.
	5.4	Community assessment.
	5.5	Reflection.
Module 6. Defense of results, summarizing and reflecting on activities.	6.1	Defense of project implementation results.
	6.2	Community assessment.
	6.3	Evaluation of the project report.
	6.4	Reflection.