**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** | Animal anatomy |
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| **Course workload,** CU/ac.h. | 12/432 |
| **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.<br>- The facial part of the skull.<br>- The cerebral part of the skull. |
| | Topic 2.4. Musculoskeletal system.<br>- Thoracic limbs and their girdle.<br>- Pelvic limbs and their girdle. |
| | Topic 2.5. Bone connection (arthrosyndesmology)<br>- 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.<br>- By origin, form, internal architectonics, function, topographical feature. |
| | Topic 3.3. Muscles of the axial skeleton.<br>- 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.<br>- Dorsal muscles of the shoulder girdle and vertebral column. Ventral muscles of the neck, lower back, tail. |
| | Topic 3.5. Chest muscles.<br>- Inhaler muscles, exhalator muscles and diaphragm. |
| | Topic 3.6. Abdominal wall muscles. |
| | Topic 3.7. Head muscles.<br>- Philo- and ontogenesis. Facial and masticatory muscles. Muscles of the sublingual apparatus. |
| | Topic 3.8. Limb muscles.<br>- Philo and ontogenesis. |
| | Topic 3.9. Muscles of the thoracic limb.<br>The muscles of the shoulder joint, elbow joint, wrist joint, finger joints and short finger muscles. |

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| | Topic 3.10. Pelvic limb muscles.<br>- The muscles of the hip joint, knee joint and the metatarsal joint. |
| | Topic 3.11. Muscles of the finger joints. |
| Section 4. General (skin) cover. | Topic 4.1. General morphofunctional characteristics of the skin and its derivatives. |
| Section 5. Nervous system (neurology). | Topic 5.1. Morphofunctional characteristics, anatomical composition and structural elements, the principle of the nervous system. |
| | Topic 5.2. The central part of the nervous system.<br>- Structure and development of the central nervous system. The structure of the spinal cord and brain, functional characteristics. Conductor apparatus |
| | Topic 5.3. Peripheral part of the nervous system.<br>Morphofunctional characteristics of cranial and spinal nerves. General and species-specific signs of structure, branching and location. |
| | Topic 5.4. The autonomic part of the nervous system.<br>- Anatomical, functional and topographic characteristics. Regularities of the structure, formation and distribution of sympathetic, para- and metasympathetic nervous structures. |
| Section 6. Analyzers. | 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 exteroreceptors. |
| Section 7. The endocrine system. | 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. |
| Section 8. Cardiovascular system. | Topic 8.1. Anatomical composition, morphogenesis and structural and functional characteristics of the cardiovascular system and its relationship with other body systems. |
| | Topic 8.2. Circulatory system.<br>- Structure, development, species and age characteristics. Specific features, basic patterns of the structure, branching and location of blood vessels. Circulatory circles. |
| | Topic 8.3. Lymphatic system.<br>- General morphofunctional characteristics and anatomical composition of the system. Its development. General patterns and specific features of the location of the lymphatic system. |

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| | Topic 8.4. organs of hemo- and immunopoiesis.<br>Morphofunctional characteristics, anatomical composition and classification of organs. The structure, location and specific features of hematopoietic organs and organs of the immune system. |
| Section 9. Splanchnology. | 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. |
| | Topic 9.2. Digestive system.<br>- 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. |
| | Topic 9.2.1. Head department (oral cavity and pharynx).<br>- Specific and functional features of the structure of the organs of the vestibule of the mouth. Glandular apparatus of the head intestine. |
| | Topic 9.2.2. Anterior section (esophageal-gastric)<br>- Structure, topography, species and age features. Morphogenesis of the stomach and omentum. Classification of stomachs. Structure and functions of the mesh gutter in ruminants. |
| | Topic 9.2.3. Middle section (small intestine)<br>- Structure, topography, species and age features. Morphogenesis of the stomach and omentum. Classification of stomachs. Structure and functions of the mesh gutter in ruminants. |
| | Topic 9.2.4. Posterior section (large intestine).<br>- Anatomical and topographic characteristics of the structure, morphogenesis, species and age features, functional purpose. |
| | Topic 9.3. Breathing apparatus.<br>- 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. |
| | Topic 9.4. The urinary apparatus.<br>- Morphogenetic relationship and functional difference of organs of urination and reproduction. Morphofunctional characteristics of the device. X-ray-anatomy of the genitourinary apparatus. |

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| | Topic 9.4.1. Urinary organs.<br>- 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. |
| | Topic 9.4.2. Organs of reproduction.<br>- Anatomical composition and structure of reproductive organs. Species, age and topographical features of the genitals and the causes of their appearance. |
| 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** | History of Russia |
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| **Course workload,** CU/ac.h. | 4/144 |
| **CONTENT OF THE DISCIPLINE** | |
| **Name of the discipline section** | **Contents of the section (topic)** |
| **Section 1.**<br>**History as a science** | Essence of the main functions of historical knowledge; the concept of historical sources, their types and content; the essence of the main methodological approaches in historical science and their founders, the basic principles and methods of historical research |
| **Section 2**<br>**Ancient Rus'** | Chronological and geographical framework of the history of Russia. The history of Russia as part of world history. Human Origins. Ethnogenesis of the Eastern Slavs as a people of the Indo-European family. The main stages of the formation of the state of Rus in early medieval Europe. Acceptance of Christianity. Influence of the heritage of ancient civilizations on Rus'. |
| **Section 3**<br>**Rus' at the end of the 10th - the first half of the 13th centuries.** | Features of the social system of the countries of Europe and Asia during the Middle Ages. The evolution of the East Slavic statehood by the beginning of the 12th century; features of the development of the largest centers of Rus' of this period: the Vladimir-Suzdal and Galicia-Volyn principalities, the Novgorod Republic. Mongol conquests in Asia and Europe. Rus"s struggle for independence in the thirteenth century. Western expansion. Consequences and significance of the establishment of Mongol domination. Rus' in the system of the Horde state. |
| **Section 4**<br>**Russian lands in the second half of the 13th - early 16th centuries. and European Middle Ages** | The process of formation of a single state in the early modern times in Rus' and in the countries of Western Europe (England, France, Spain, Portugal): general and special. Influence of natural and climatic conditions.The main events of the final stage of the formation of a unified Russian state. The reign of Ivan III. Economy, society, system of government, culture. Grand Duchy of Lithuania. Influence of East and West on the development |

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| | of Russia at the turn of the 15th - 16th centuries. |
| **Section 5**<br>**Russia and the countries of Western Europe in the XVI - XVII centuries.** | The origin of the concept of "New time", chronological framework and periodization. Russia and the countries of Western Europe in the sixteenth century. The reign of Ivan IV. Serfdom and capitalist vectors of development in the East and West of Europe. The concept of "Moscow - the Third Rome".Culture of the Middle Ages. Systemic crisis at the beginning of the 17th century. Troubled times in Russia. The fight against foreign intervention and its consequences. Modernization processes in the West and in Russia. Board of Alexei Mikhailovich. Church reform. Old Believers as a Russian form of Protestantism. Accession of Ukraine. Thirty Years' War and the Westphalian system of international relations. |
| **Section 6**<br>**Russia, West and East in the XVIII century.** | Reforms of Peter I. Modernization and its features in Russia. Foreign policy of Russia in the first quarter of the 18th century. The formation of the Russian empire and its features. The era of palace coups. The reign of Elizabeth Petrovna. Seven Years' War. Age of Enlightenment. The reign of Catherine II. Peasant uprisings. Russia's relations with the countries of the West and East (wars and alliances). Revolution of 1789 in France and its influence on the domestic and foreign policy of Russia. The reign of Paul I. Gallomania of the Russian elite. Culture of Russia XVIII. Social thought (N.I. Novikov, M.M. Shcherbatov, A.N. Radishchev). Freemasonry. cultural influences. |
| **Section 7**<br>**Russia and the world in the first half of the nineteenth century.** | The era of wars and "revolutionary storms" of the late 18th - early 19th centuries. in Europe. Transformations of Alexander I. Patriotic War of 1812: influence on the development of the country and international relations. Foreign trip. Decembrism.The rise of nationalism in Europe. Features of the socio-economic, political and cultural development of Russia and Western countries. The reign of Nicholas I. The "Golden Age" of Russian literature. Westernizers and Slavophiles. Russia's foreign policy and the surge of Russophobia. Russia and Poland. |
| **Section 8**<br>**Russia and the world in the second half of the nineteenth century.** | Eastern question in the system of international relations. Crimean War and its aftermath. The abolition of serfdom in Russia and the American Civil War. Features of the social structure of Russia in the era of market modernization. national question. The results of the reign of Alexander II. Social movement in post-reform Russia: liberals, conservatives, populists, Marxists. Disputes about the ways of development of Russia and its relation to the West. Accession to Russia of Central Asia. Policy of Alexander III. International relations in the 1870-1890s. The beginning of the formation of military blocs. The formation of the colonial system. "Great Game" - confrontation between Russia and Britain in the East. Russian policy in the East. Relationship features. Russian Empire and its national outskirts. Culture and science of |

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| | Russia in the 2nd half of the 19th century. |
| **Section 9**<br>**Russia and the world at the beginning of the twentieth century.** | Features of the imperial policy of Russia, Great Britain, France and Germany. Rapprochement between Russia and France. Formation of the Entente. Growing global socio-economic crisis. Russian reforms in the context of world development at the beginning of the 20th century. Life of the city and the countryside. The first Russian revolution. Socio-economic and political development of Russia in 1907-1917. III and IV State Dumas. Political parties. theory of imperialism. Completion of the division of the world and aggravation of imperialist contradictions. Stacking blocks. The beginning of the war. Side plans. The impact of the war on the economy and society of the Russian Empire. A national crisis is brewing. Consequences of the war. Versailles system of international relations. The development of culture and science in the early twentieth century. Silver Age" of Russian Literature. |
| **Section 10**<br>**Russia and the world in 1917 - 1939** | The Great Russian Revolution of 1917–1922: Causes, Essence, Chronological Framework in Historical Literature, Results. The revolutionary crisis in Europe in 1918–1919: the idea of a world revolution and attempts to implement it. Civil War. The formation of the Soviet socio-political model. Formation of a one-party political system. National outskirts of Russia during this period. Education of the USSR. Features of the Soviet national policy and national-state structure. War communism. New economic policy. Intra-party struggle in the CPSU (b). Strengthening of power I.V. Stalin. The course towards the construction of socialism in one country. Modernization in the USSR in the 1930s Implementation of socialist industrialization in the USSR. The first five-year plans and their results. Mass collectivization of agriculture and its consequences. Successes of Soviet power in the cultural and educational spheres. The evolution of the political regime. Formation of the authoritarian foreign policy of the USSR in the 1930s. The world economic crisis of 1929 and the "Great Depression", their impact on the development of Western countries. Rise of Fascism and National Socialism. F. Roosevelt's New Deal. "People's Fronts" in Europe. Civil War in Spain. Japanese aggression on Lake Khasan and on the Khalkin-Gol River. Molotov-Ribbentrop Pact. Soviet-Finnish war. Modern disputes in the historical literature on international relations in 1939–1941. political system. Repression. Discussions about the events of the 1930s The theory of totalitarianism. their influence on the development of Western countries. Rise of Fascism and National Socialism. F. Roosevelt's New Deal. "People's Fronts" in Europe. Civil War in Spain. Japanese aggression on Lake Khasan and on the Khalkin-Gol River. Molotov-Ribbentrop Pact. Soviet-Finnish war. |

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| | Modern disputes in the historical literature on international relations in 1939–1941. political system. Repression. Discussions about the events of the 1930s The theory of totalitarianism. their influence on the development of Western countries. Rise of Fascism and National Socialism. F. Roosevelt's New Deal. "People's Fronts" in Europe. Civil War in Spain. Japanese aggression on Lake Khasan and on the Khalkin-Gol River. Molotov-Ribbentrop Pact. Soviet-Finnish war. Modern disputes in the historical literature on international relations in 1939–1941. political system. Repression. Discussions about the events of the 1930s The theory of totalitarianism. |
| **Section 11**<br>**The Second World War.** | Background and the beginning of World War II. The Great Patriotic War - the main stages. Restructuring the economy on a war footing. Changes in the structure of power, in the life of the Soviet people. Creation of the anti-Hitler coalition. The main battles of the Great Patriotic War. Partisan struggle. Soviet rear during the war. Liberation of the occupied territories of the USSR and Eastern European states from the fascist invaders. Heroism of the Soviet people. Generals. Development by allies of global strategic decisions on the post-war reorganization of the world (Tehran, Yalta, Potsdam conferences). world of concentration camps. The Nuremberg trials: the conviction and punishment of leading Nazi criminals. Modern falsifications of the history of the Second World War. Discussions about the culprit of the war, the price of victory and the role of the USSR in the defeat of Nazi Germany. Collaborationism and the policy of the USSR in relation to the national fascists in the Western territories. The decisive contribution of the Soviet Union to the defeat of fascism and Japanese militarism. Module "No statute of limitations". |
| **Section 12.**<br>**USSR and the world in 1945-1991.** | Power and society in the USSR in the first post-war years. Formation of a bipolar world. Loss of US nuclear monopoly. New international organizations. Beginning of the Cold War. Creation of NATO. The Marshall Plan and the final division of Europe. Formation of the socialist camp. Establishment of the Council for Mutual Economic Assistance (CMEA). Reformatory searches in the Soviet leadership. Scientific and technological revolution and its impact on the course of world development.<br>The content and significance of the reforms of G.M. Malenkov and N.S. Khrushchev in the development of the USSR economy in 1954-1964. XX Congress of the CPSU and its influence on the development of the country and international relations. "Thaw" in the spiritual sphere. Changes in the theory and practice of Soviet foreign policy. Anti-constitutional transfer of Crimea and Sevastopol to Ukraine by the RSFSR. |

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| | The collapse of the colonial system. Aggravation of the international situation. Creation of the Warsaw Pact Organization (OVD). The victory of the revolution in China and the creation of the PRC. Korean War 1950–1953 Japan after World War II. Creation of the State of Israel and the problem of conflict resolution in the Middle East. Hungarian events in 1956<br>Formation of the non-aligned movement. Arab revolutions, "free Africa". Revolution in Cuba. Increasing confrontation between the superpowers and the two world systems. Berlin Crisis 1961 Caribbean Crisis (1962).<br>The development of the world economy in 1964-1991. Creation and development of international financial structures (World Bank, IMF, IBRD). Transformation of neo-colonialism and economic globalization. Integration processes in post-war Europe. Creation of the European Economic Union.<br>USSR in the mid-1960s - 1980s: stabilization and growth of crisis phenomena. The era of "stagnation". Power and society in the first half of the 80s. Formation of the dissident movement in the USSR. War in Vietnam. Arab-Israeli conflict. Socialist movement in the countries of the West and East. The political crisis of 1968 in the socialist countries and the consequences of its solution by force.<br>Creation of the nuclear missile shield of the USSR. Achieving strategic parity with NATO. Helsinki Conference on Security in Europe (August 1975). Formation of the CSCE (since 1994 - the OSCE). Nuclear club. IAEA. Formation of control systems for the non-proliferation of nuclear weapons. The participation of the armed forces of the Soviet Union in the internal political events in Afghanistan.<br>Causes and the first attempts to comprehensively reform the Soviet system in 1985. The policy of "acceleration". Gorbachev's "perestroika". Strengthening centrifugal tendencies in a multinational state (1990-1991). "Parade of Sovereignties". "New political thinking" and changes in the geopolitical position of the USSR. Foreign policy of the USSR in 1985–1991 Discussion about the end of the Cold War. The withdrawal of Soviet troops from Afghanistan. The collapse of the CMEA and the crisis of the world socialist system. GKChP and its consequences: the collapse of the USSR, the cessation of the activities of the CPSU. Formation of the Commonwealth of Independent States (CIS). Culture and science of the USSR in 1945-1991. |
| **Section 13.**<br>**Russia and the world in the late XX - early XXI centuries.** | Russia in the 1990s Search for a development path. The liberal concept of Russian reforms: the transition to the market, the first steps towards the formation of civil society and the rule of law. "Shock therapy" - economic reforms of the early 1990s Fall of industrial and agricultural production, scientific and technical potential. |

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| | Formation of the right of private property. Polarization of society. The political crisis of 1993 and the forcible dismantling of the system of power of the Soviets. The Constitution of the Russian Federation of 1993 Aggravation of interethnic relations. Military-political crisis in Chechnya, its causes and consequences. Formation of new power structures in Russia. Formation of a multi-party system. Education, science and culture in a market economy. The collapse of liberal reforms. Foreign policy in 1991 - 1999 concessions to the West. Difficulties in establishing political, military and economic ties with the CIS countries. Collective Security Treaty of the CIS countries. Measures to protect Russian compatriots living in the post-Soviet space. Formation of the Union of Russia and Belarus. Contractual principles of the Russian Federation with NATO and the Council of Europe. Globalization of the world economic, political and cultural space. Russia's place in the multipolar world. Eastward expansion of NATO and the EU. Regional and global interests of Russia. Russian Federation at the beginning of the XXI century. Modern problems of mankind and the role of Russia in their solution. Changes in the political system of Russian society. Presidency V.V. Putin, his domestic and foreign policy, the national idea. Socio-economic situation of the Russian Federation in the period 2000-2017 Models of modernization of society and ways to intensify the Russian economy. Strategy of the state national policy of the Russian Federation. World financial and economic crises and their impact on the Russian economy. Russia's change of priorities in foreign policy at the turn of the 20th-21st centuries. Establishing international economic and military ties. EurAsEC (since 2015 EAEU), CSTO, SCO, BRICS. Russia's entry into the WTO. Joint declaration of Russia and China on a multipolar world. The modern concept of Russian foreign policy in a multipolar world. Russian opposition to US attempts to invade the sphere of geopolitical interests in the Caucasus, Central Asia and the Baltics. The use of US military force against Yugoslavia and Iraq. The elimination of statehood in Libya. The creation of extremist movements supported by the United States as the main factor in the migration of the population from the countries of the Middle East and North Africa. International terrorism, refugees. Georgian-Russian military conflict in August 2008. Coup d'état in Ukraine (February 2014). Russia in the context of modern geopolitical challenges. The essence of the global processes of modernity. Refusal to fight neo-Nazism in the countries that were former members of the anti-Hitler coalition (Great Britain, the USA, etc.) in violation of the Resolution of the 69th session of the UN (December 2014). Return of Crimea and Sevastopol to the Russian |

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| | Federation. US and EU sanctions against Russia and their consequences. Growing international tension. 2022 The beginning of the NWO. The policy of aggressive Russophobia on the part of the United States and NATO countries. Information wars against the Russian Federation. "Cancellation of culture". Culture and religion in modern Russia. Coup d'état in Ukraine (February 2014). Russia in the context of modern geopolitical challenges. The essence of the global processes of modernity. Refusal to fight neo-Nazism in the countries that were former members of the anti-Hitler coalition (Great Britain, the USA, etc.) in violation of the Resolution of the 69th session of the UN (December 2014). Return of Crimea and Sevastopol to the Russian Federation. US and EU sanctions against Russia and their consequences. Growing international tension. 2022 The beginning of the NWO. The policy of aggressive Russophobia on the part of the United States and NATO countries. Information wars against the Russian Federation. "Cancellation of culture". Culture and religion in modern Russia. Coup d'état in Ukraine (February 2014). Russia in the context of modern geopolitical challenges. The essence of the global processes of modernity. Refusal to fight neo-Nazism in the countries that were former members of the anti-Hitler coalition (Great Britain, the USA, etc.) in violation of the Resolution of the 69th session of the UN (December 2014). Return of Crimea and Sevastopol to the Russian Federation. US and EU sanctions against Russia and their consequences. Growing international tension. 2022 The beginning of the NWO. The policy of aggressive Russophobia on the part of the United States and NATO countries. Information wars against the Russian Federation. "Cancellation of culture". Culture and religion in modern Russia. former members of the anti-Hitler coalition (Great Britain, USA, etc.) in violation of the Resolution of the 69th session of the UN (December 2014). Return of Crimea and Sevastopol to the Russian Federation. US and EU sanctions against Russia and their consequences. Growing international tension. 2022 The beginning of the NWO. The policy of aggressive Russophobia on the part of the United States and NATO countries. Information wars against the Russian Federation. "Cancellation of culture". Culture and religion in modern Russia. former members of the anti-Hitler coalition (Great Britain, USA, etc.) in violation of the Resolution of the 69th session of the UN (December 2014). Return of Crimea and Sevastopol to the Russian Federation. US and EU sanctions against Russia and their consequences. Growing international tension. 2022 The beginning of the NWO. The policy of aggressive Russophobia on the part of the United States and NATO |

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| | countries. Information wars against the Russian Federation. "Cancellation of culture". Culture and religion in modern Russia. |
| **Section 14. The role of RUDN University P. Lumumba as "soft power" in the Moscow Region** | The evolution of international relations in the XX - XXI centuries. USSR and Russia in the context of geopolitical challenges. Peace initiatives of the USSR in the post-war period, features of the opening of the UDN in 1960, the mission of the University, features of the activities of the first rector - S. V. Rumyantsev, the second rector - V. F. Stanis, the third rector - V. M. Filippov. Rector of RUDN University P.Lumumba since 2020 O.A.Yastrebov. |

| **Course title** | Latin language |
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| **Course workload,** CU/ac.h. | 4/144 |
| **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.<br>Anatomical term with consonant and inconsonant definition. |
| | Topic 2.4. III declension. The concept of equal and unequal declension. Types of the third declension.<br>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 general introduction to clinical terms. Greek-Latin doublets and single term elements. |
| | Topic 3.3. Greek-Latin doublets for organs, body parts, |

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| | tissues. Greek terms denoting doctrine, science, method of diagnostic examination, treatment, suffering, disease.<br>1. The notion of a finite term-element. The Greek term elements denoting pathological changes of organs and tissues, therapeutic and surgical techniques. |
| | Topic 3.4. Greek-Latin doublet designations of tissues, organs, secretions, secretions, sex, age.<br>Types of non-surgical and surgical treatment.<br>Single term-elements denoting functional and pathological conditions and processes. Term-elements-equivalents. |
| | Topic 3.5. Greek-Latin doublets denoting various physical properties, qualities, relations and other attributes. |
| | Topic 3.6. Pathology of the oral cavity: basic terms and the way they are formed. |
| Section 4: Pharmaceutical Terminology. Prescription<br>(on the STEPIK online platform) | Topic 4.1. The concept of a medicinal substance, drug, dosage form. Methods of formation of a pharmaceutical term. |
| | Topic 4.2. Verb. Vocabulary form. The imperative and subjunctive inclinations. |
| | 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. |
| | Topic 4.4 Chemical nomenclature. Oxides and acids. |
| | Topic 4.5. Names of salts in pharmaceutical terminology. Ethers. Potassium-sodium salts. |
| | Topic 4.6. The most important prescription abbreviations. |

| **Course title** | Inorganic and analytical chemistry |
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| **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. Chemical equilibrium. | Topic 2.1 Fundamentals of thermochemistry. |
| | Topic 2.2 Enthalpy. |
| | Topic 2.3 Hess's Law. |
| | Topic 2.4 Entropy. |

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| | 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. |

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| | 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 |
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| **Course workload,** CU/ac.h. | 2/72 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. Introduction | 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.<br>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.<br>Basic principles of qualitative and quantitative analysis, methods of establishing the structure of organic compounds. |
| Section 2. Hydrocarbons. | Topic 2.1. Alkanes. Homological series. Nomenclature, isomerism, methods of preparation of alkanes. Physical properties. Chemical properties. Identification of alkanes. |
| | 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. |
| | 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. |
| | 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 plastics. Identification of dienes. |
| Section 3: Aromatic | Section 3.1. Aromatic hydrocarbons (arenes). Homological |

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| hydrocarbons and homofunctional compounds. | 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. |
| | Section 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. |
| | Section 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.<br>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. |
| | Section 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.<br>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. |
| | Section 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. |
| Section 4. Carboxylic Acids and Heterofunctional Compounds | Section 4.1. Carboxylic acids. Isomerism and nomenclature. Structure of the carboxylic group. Influence of the structure of carboxylic acids on their acidic properties. Methods for |

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| | 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. |
| | Section 4.2. Lipids. Natural fats and oils - glycerides of higher fatty acids. Hydrolysis of fats, soaps. Hydrogenation of fats, margarine. |
| | Section 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. |
| | Section 4.4. Bivalent carboxylic acids, methods of their production, properties and applications. Unsaturated bivalent acids. |
| | Section 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. |
| | Section 4.6. Oxo acids (aldehyde and keto acids). Nomenclature, structure and methods of production. Chemical properties. |
| | Section 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. |
| Section 5. Carbohydrates | Section 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 |
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| **Course workload,** CU/ac.h. | 3/108 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. General provisions on law. | Topic 1.1. The concept and essence of law. Russian law and legal families. Rule of law. Sources of law. The system of Russian law and its structural elements. Legal relationship. Lawful Conduct, Misconduct and Legal Liability. International law. |
| Section 2. General provisions on the state. | Topic 2.1. Theories of the origin of the state. The concept and main features of the state. The form of the state. Constitutional state. |
| Section 3. Fundamentals of constitutional law. | Topic 3.1. The concept of constitutional law as a branch of law. Subject and method of constitutional law. Sources of constitutional law. Basic institutions of constitutional law. |
| Section 4. Fundamentals of civil law. | Topic 4.1. The concept of civil law as a branch of law. The subject and method of civil law. Sources of civil law. The main institutions of civil law. Individuals and legal entities as subjects of civil law. The concept and content of property rights. The concept of a civil transaction. The concept and content of a civil contract. Concept and types |

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| | of obligations. |
| Section 5. Fundamentals of criminal law. | Topic 5.1. The concept of criminal law as a branch of law. The subject and method of criminal law. Sources of criminal law. The main institutions of criminal law. Concept, sign and corpus delicti. The concept of criminal liability. The concept and types of criminal penalties. |
| Section 6. Fundamentals of labor law. | Topic 6.1. The concept of labor law as a branch of law. The subject and method of labor law. Sources of labor law. The main institutions of labor law. Labor contract: concept, content and types. Working hours and rest time. The concept of remuneration. Labor discipline and work schedule. Labor disputes: concept and types. |
| Section 7. Fundamentals of family law. | Topic 7.1. The concept of family law as a branch of law. The subject and method of family law. Sources of family law. The main institutions of family law. The concept, signs, conditions and procedure for marriage. Invalidation of marriage. Divorce. The rights and obligations of the spouses. The rights of minor children. Alimony obligations. |

| **Course title** | Biology with the basics of ecology |
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| **Course workload,** CU/ac.h. | 3/108 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 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. |
| Section 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** | Veterinary genetics |
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| **Course workload,** CU/ac.h. | 2/72 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. Genetics and its place | Topic 1.1 The subject of genetics. |

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| in the system of natural sciences. | 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 reproduction. | Topic 2.1 Mendel's laws. |
| | Topic 2.2 Dominance types. |
| | 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. |

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| | 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. |

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| Section 13. Biotechnology | Topic 13.1 Genetic and cell engineering, cloning, transgenic plants and animals |

| **Course title** | Biological physics |
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| **Course workload,** CU/ac.h. | 2/72 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 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. |
| Section 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.<br>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. |
| Section 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. |
| Section 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 |

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| | thermodynamics. Entropy. Living organisms as thermodynamic systems. Entropy of biological systems. |
| Section 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.<br>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. |
| Section 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. |

| **Course title** | Computer science |
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| **Course workload,** CU/ac.h. | 2/72 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. Office365 corporate service | Topic 1.1. Service architecture, General settings, Access policies<br>Outlook, Calendar, Users<br>OneDrive, Teams |

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| Section 2. Microsoft Word 2016 text editor | Topic 2.1. General settings<br>Typing rules<br>Page Setup<br>Paragraph formatting<br>Bullets, lists, and numbers<br>Graphic Objects<br>Tables<br>Patch and annotations<br>Templates<br>Styles, Headings, Table of contents<br>References<br>Document Merging |
| Section 3. Microsoft Excel 2016 spreadsheet processor | Topic 3.1. General Information<br>Cell format<br>Addressing<br>Formulas and functions<br>Diagrams<br>Sorting<br>Filters<br>Summary tables<br>Connecting to External Sources |
| Section 4. Microsoft PowerPoint 2016 Presentation Preparation Software | Topic 4.1. General Information<br>Slide options<br>Images<br>SmartArt<br>Tables<br>Animations<br>Recommendations |

| **Course title** | Physical and Colloidal Chemistry |
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| **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. |

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| | 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 ebulioscopy. 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 |

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| | 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. |
| | 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). |
| | Topic 5.5 Kinetic stability of free-dispersed systems. Sedimentation. Analysis of dispersity of colloidal systems according to sedimentation and centrifugation. |

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| | Suspensions. Hypsometric law. |
| | 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). |
| Section 6. Electrical phenomena in dispersions.<br>Aggregative stability.<br>Coagulation. | 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. |
| | Topic 6.2 Electrokinetic phenomena (electrophoresis, electro-osmosis, sedimentation and flow potentials) and their practical significance. Electrophoresis. Helmholtz-S Moluchowski equations. |
| | 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. |
| | 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. |
| Section 7. Lyophilic colloids. Solutions of high molecular weight compounds (HMS) and their properties. | 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. |
| | 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). |
| | 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** | Philosophy |

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| **Course workload,** CU/ac.h. | 3/108 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 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. |
| Section 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. |
| Section 3. Man and Society | Topic 3.1. Philosophical models of society and so-cial development |
| | Topic 3.2. Philosophical theories of justice |
| | Topic 3.3. Modern ethical theories. Axiology as a philosophical doctrine of values |

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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 |

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| **Course title** | Life safety |
| **Course workload,** CU/ac.h. | 3/108 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. Theoretical | Topic 1.1. Basic concepts, terms and definitions. |

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| foundations of life safety | Topic 1.2. Characteristic systems "man - environment". |
| | Topic 1.3. Industrial, urban, household, natural environment. |
| | Topic 1.4. Human interaction with the environment. |
| | Topic 1.5. Law of preservation of life Kurazhkovsky Yu.N. |
| | Topic 1.6. Basics of optimal interaction: comfort, minimization of negative impacts, sustainable development of systems. |
| Section 2. Risk | Topic 2.1. Concept of risk. |
| | Topic 2.2. Risk assessment. |
| | Topic 2.3. General classification of risks. |
| | Topic 2.4. Damage. |
| | Topic 2.5. Risk concept. |
| Section 3. Natural emergencies and protection of the population from their consequences | Topic 3.1. Natural emergencies. |
| | Topic 3.2. Basic concepts and definitions, classification of emergency situations: geophysical and geological hazardous phenomena; meteorological and agrometeorological hazards; marine hydrological hazards; natural fires. |
| | Topic 3.3. Characteristics of damaging factors of sources of natural emergencies. |
| Section 4. Technogenic emergencies and protection of the population from their consequences | Topic 4.1. Technogenic emergencies. |
| | Topic 4.2. Basic concepts and definitions, classification of emergency situations: fires, explosions, the threat of explosions; accidents with the release (threat of release) of emergency chemically hazardous substances (AHOV); accidents with release (threat of release) of radioactive substances (RS); accidents with the release (threat of release) of biologically hazardous substances (BOV). |
| | Topic 4.3. Damaging factors of sources of man-made emergencies. Emergency development phases. |
| Section 5. The world. Hazards in daily life and safe behavior | Topic 5.1. The world around and the person, the nature of their interaction. Man as an object and subject of security. Situations arising in the process of human life. |
| | Topic 5.2. Features of the city as a habitat. Hazardous areas in the city. |
| Section 6. Dangers in everyday life. Social dangers | Topic 6.1. Protection against natural disasters. |
| | Topic 6.2. Protection against global influences. |

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| | Topic 6.1. Protection against terrorism. |
| Section 7. Biological and social emergencies | Topic 7.1. Quarantine. |
| | Topic 7.2.Observation. |
| | Topic 7.3. Pandemics of the 20th - 21st centuries |
| Section 8. Harmful addictions and their social consequences | Topic 8.1. Computer addiction. |
| | Topic 8.2. The effect of alcohol on the human body. |
| | Topic 8.3. Drug addiction and substance abuse. |
| | Topic 8.4. Smoking and its impact on human health. |

| **Course title** | Biological chemistry |
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| **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.<br>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. |

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| | 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 inHElved 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 |

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| 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.<br>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.<br>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. |

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| 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.<br>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.<br>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** | Veterinary Microbiology and Mycology |
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| **Course workload,** CU/ac.h. | 6/216 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. Systematics, morphology and structure of microorganisms | Topic 1.1. The concept of the taxonomy and classification of microorganisms. Taxonomic categories. The principles of modern classification of bacteria according to Burgey. Prokaryotes and eukaryotes. Basic forms and polymorphism of bacteria. The structure of the bacterial cell. Features of the morphology and structure of spirochetes, actinomycetes, mycoplasmas, rickettsia, chlamydia. |
| Section 2. Physiology of microorganisms | Topic 2.1. The chemical composition of the bacterial cell. Enzymes of microorganisms, their classification. Microorganism nutrition. The essence and types of biological oxidation of substrates by microorganisms. Classification of microbes by the type of respiration. The growth and reproduction of microorganisms. Culture media for the cultivation of microorganisms and requirements for them, classification of culture media. Features of the cultivation of strict anaerobes. The concept of cultural, enzymatic and other properties of microbes. |
| Section 3. The influence of environmental factors on microorganisms | Topic 3.1. The influence of physical factors. The concept of sterilization and asepsis. The action of chemicals. The concept of disinfection and antiseptics. The action of biological factors on microorganisms. Colicins. Bacteriophages. Nature, properties, structural features. Practical application of bacteriophages in veterinary medicine. Antibiotics Antibiotic producers, principles of |

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| | their production. Mechanism and spectrum of action of antibiotics. Antibiotic resistance of microbes. |
| Section 4. Microorganism genetics | Topic 4.1. The concept of heredity and variability. Genetic code and information transfer. The concept of genome, genotype and phenotype. Chromosomal and extrachromosomal genetic determinants (plasmids). The nature of microbial variability. Phenotypic manifestation of variability (dissociation, modification). Genotypic variability. Spontaneous and induced mutations in bacteria. Recombination variability in bacteria. Polymerase chain reaction (PCR), DNA probes. The value of the doctrine of the variability of microbes in the diagnosis and specific prevention of infectious diseases. |
| Section 5. The spread of microorganisms in nature | Topic 5.1. Microorganisms as symbiotic partners: mutualism, commensalism, parasitism, antagonism. Microflora of soil, water and air. Microflora of the body of animals. Dysbacteriosis, its causes and methods of correction. Normal microflora and its protective function. Probiotics for veterinary use. |
| Section 6. Fundamentals of Sanitary Microbiology | Topic 6.1. The purpose and objectives of sanitary and microbiological research of objects of veterinary supervision. Sanitary indicative microorganisms, characteristics of their properties. Principles of sanitary and microbiological research of water, soil, air of livestock buildings. Sanitary assessment of environmental objects for microbiological indicators. Transmission of pathogens of infectious diseases through water, soil and air.<br>Microflora of manure. Microbiological processes of utilization of fiber, protein and other compounds in manure, depending on the storage method (aerobic, aerobic-anaerobic, anaerobic). Survival of pathogenic microorganisms in manure.<br>Microflora of feed. Microbiological bases of green plant conservation (silage, haylage, hay). Principles of sanitary and microbiological assessment of the good quality of concentrated, juicy, roughage and animal feed. Indication of pathogenic microbes and microbial toxins in feed.<br>Causative agents of foodborne diseases and toxicosis. Principles and methods of their diagnosis. |
| Section 7. Fundamentals of the doctrine of infection | Topic 7.1. Definition of the concept "infection - infectious process". Infectious disease. Stages of development and clinical manifestations of an infectious disease. The concept of sepsis, bacteremia, toxemia, septicopyemia. Microbearer. The concept of pathogenicity and virulence of microbes. Virulence units. The main factors of pathogenicity. |
| Section 8. Immunity | Topic 8.1. Definition of the concept of "immunity". The immune system and its functions. Central and peripheral organs of the immune system. Function of T and B lymphocytes. Cooperative relationships in the immune response with the participation of histocompatibility |

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| | complex antigens, phagocytes, T- and B-lymphocytes. Forms of the immune response: synthesis of antibodies and cellular factors, immunological memory, tolerance, allergy. Antigens. The concept of "antigen". Antigens of animal origin and bacterial cells. Antigenic determinants (epitopes) of bacteria. The main properties of a complete antigen. Antigenic specificity. Haptens and their properties. Antibodies. The concept of antibodies. Their nature and function. The structure of immunoglobulins of various classes. The concept of the active center of antibodies. Primary and secondary immune responses. Antigen-antibody interaction phenomena. Serological reactions. Allergy. The concept of allergies, its types. Hypersensitivity of immediate and delayed types. The mechanism of development of both types of hypersensitivity. Infectious allergy. Immunological tolerance. Factors contributing to tolerance. Types of immunity. The concept of the natural resistance of a macroorganism. Inherited resistance factors. Acquired immunity: post-infectious, post-vaccination, active and passive, colostral, antitoxic, sterile and non-sterile; local immunity. Biologicals. Principles of control for sterility, harmlessness, reactogenicity and activity. |
| Section 9. Causative agents of staphylococcosis and streptococcosis | Topic 9.1. General characteristics of the main taxonomic groups. Spreading. Role in animal and human pathology. Staphylococci. Characterization of morphological, tinctorial, cultural and enzymatic properties of the main types of staphylococci. Pathogenic factors. Methods for their identification. Antigenic structure. Stability. Drug resistance. Sampling of material for research. Bacteriological diagnosis of infections of staphylococcal etiology. Differentiation from non-pathogenic staphylococci. Features of immunity. Biologicals for specific prophylaxis of staphylococcosis.<br>Streptococci. Significance in animal and human pathology. General characteristics of biological properties. Toxins and pathogenic factors. Antigenic structure. Classification of pathogenic streptococci. Immunogenic properties and post-infectious immunity.<br>The causative agent of myta. Morphology, tinctorial, cultural and enzymatic pathogenic properties. Pathological material and bacteriological diagnostics of myta. Differentiation of the pathogen of myta from other types of streptococci. Formation of immunity. Biologicals.<br>The causative agent of mastitis. Morphology, tinctorial, cultural and enzymatic properties, pathogenicity. Bacteriological diagnosis of streptococcal mastitis. Differentiation of streptococcus mastitis from other types of streptococci. Features of immunity. Used biological products.<br>The causative agent of pneumococcal infection (septicemia) of young animals. Morphology, tinctorial, |

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| | cultural, enzymatic properties, pathogenicity. Age susceptibility of farm animals. Selection of pathological material for research on pneumococcal infection. Bacteriological diagnostics. Immunity. Used biological products. |
| Section 10. Enterobacteriaceae | Topic 10.1. General characteristics. Classification. Role in the pathology of farm animals.<br>The causative agent of colibacillosis. The role of E. coli in the etiology of colibacillosis of young farm animals, edematous disease of piglets. Age susceptibility of farm animals. Antigenic structure. Morphology, tinctorial, cultural and enzymatic properties, pathogenicity. Selection of material and bacteriological diagnosis of colibacillosis. Scheme of bacteriological research. Serological identification of the causative agent of colibacillosis. Features of immunity in escherichiosis. Biologicals.<br>Causative agents of salmonellosis. Significance in human and animal pathology. Age susceptibility of farm animals; the importance of the carrier of bacteria in adult animals; sensitivity of laboratory animals. Antigenic structure. Salmonella persistence. Morphology, tinctorial, cultural and enzymatic properties, pathogenicity. Selection of material for research. Scheme of bacteriological research. Serological identification (serogroups). Features of immunity. Biologicals. |
| Section 11. The causative agents of pig erysipelas and listeriosis | Topic 11.1. The causative agent of pig erysipelas. Distribution in nature and significance in human and animal pathology. Basic biological properties. Spectrum of pathogenicity. Stability in the external environment. Laboratory diagnostics. Differentiation of erysipelas from listeria and the causative agent of septicemia in mice. Immunity. Biologicals.<br>The causative agent of listeriosis. Distribution in nature and significance in the pathology of animals and humans. Basic biological properties. Susceptibility of farm animals. Resistance of Listeria to low temperatures and other physicochemical factors. Selection of pathological material. Laboratory diagnostics of listeriosis. Differentiation of listeria from the causative agent of swine erysipelas. Immunity. Biologicals. |
| Section 12. Pathogenic mycobacteria | Topic 12.1. General characteristics of the mycobacteria family. Features of morphology and chemical composition. The role of mycobacteria in the etiology of tuberculosis and paratuberculosis.<br>The causative agents of tuberculosis of farm animals. Characterization of tinctorial and cultural properties of Mycobacterium tuberculosis. Pathogenicity for agricultural and laboratory animals. The peculiarity of preparing material for research. Laboratory diagnostics of tuberculosis. Differentiation of pathogenic mycobacteria from acid-fast saprophytes and fast-growing mycobacteria. Allergic and serological diagnosis of tuberculosis. |

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| | Immunity. Biologicals.<br>The causative agent of paratuberculosis (paratuberculosis enteritis) in cattle. Spreading. Biological characteristics of the pathogen. Antigenic structure. Laboratory diagnostics of paratuberculosis. Differentiation of paratuberculosis mycobacteria from mycobacterium tuberculosis. Allergic diagnostics. Immunity and specific prevention of paratuberculosis. |
| Section 13. Causative agents of zoonotic infections | Topic 13.1. The causative agent of anthrax. Discovery history. Spreading. Stability in the external environment. Role in animal and human pathology. Features of the morphology of the microorganism. Capsule and sporulation. Tinctorial properties, cultural characteristics, enzymatic activity, toxigenicity, antigenic properties. Selection of pathological material. Safety at work. Laboratory diagnostic methods. Research of leather and fur raw materials for anthrax. Differentiation from soil saprophytic bacilli. Immunity. Diagnostic, preventive and therapeutic biological products.<br>The causative agent of brucellosis. Discovery history. Role in human and animal pathology. Resistance to physical and chemical factors. Morphology, tinctorial properties, peculiarities of cultivation and enzymatic properties of various species of brucella. Pathogenicity. Antigenic structure. Selection of material for research. Laboratory diagnostic methods. Scheme of bacteriological research. Serological diagnosis of brucellosis. Allergic diagnostics and features of immunity. Diagnostic and preventive biological products.<br>The causative agent of tularemia. Discovery history. Role in animal pathology. Morphology, tinctorial, cultural and biochemical properties, pathogenicity, antigenic structure. Selection of material for research. Laboratory diagnostic methods. The value of the allergic test. Immunity. Biologicals. |
| Section 14. Yersinia | Topic 14.1. The causative agent of the zooanthroponous plague. Discovery history. Spreading. The susceptibility of animals and humans. Main morphological, tinctorial, cultural and enzymatic properties; pathogenicity, antigenic structure. Stability. Selection of material for research. Plague bacteriological diagnostics. Precautions and safety measures during laboratory research. Differentiation of the causative agent of the zooanthroponous plague from Yersinia pseudotuberculosis. Biologicals.<br>The causative agent of pseudotuberculosis. Spreading. The susceptibility of animals and humans. Main morphological, tinctorial, cultural and enzymatic properties; pathogenicity, antigenic structure. Selection of material for research. Bacteriological diagnostics. |
| Section 15. The causative agent of pasteurellosis | Topic 15.1. Discovery history. Pasteurelling and the significance of this phenomenon in animal pathology. Morphological, tinctorial and other biological properties of |

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| | the pathogen. Susceptibility of agricultural and laboratory animals and birds. Resistance of pasteurella to physical and chemical factors. Laboratory diagnostics of pasteurellosis. Biologicals. |
| Section 16. Pathogenic anaerobes | Topic 16.1. Clostridia are the causative agents of anaerobic infections. Discovery history. General characteristics of biological properties. Significance in animal and human pathology. Stability in the external environment. Range of pathogenicity and toxins. Selection of pathological material and laboratory diagnosis of emphysematous carbuncle, malignant edema, tetanus, botulism, bradzot, anaerobic lamb dysentery, sheep enterotoxemia. Application of the neutralization reaction to identify and determine the type of toxins of pathogenic clostridia. Formation of immunity in clostridiosis. Used biological products. |
| Section 17. Causative agents of necrobacteriosis and hoof rot | Topic 17.1. The susceptibility of animals. General characteristics. Morphology, tinctorial, cultural and enzymatic properties, pathogenicity. Toxins. Pathogenesis. Antigenic structure. Selection of pathological material. Bacteriological diagnostics. Differentiation of pathogens. Immunity. Biologicals. |
| Section 18. Pathogenic pseudomonas | Topic 18.1. The causative agent of glanders. Discovery history. Role in animal pathology. Morphology, tinctorial, cultural and enzymatic properties. Stability. Pathogenic properties. Antigenic structure. Selection of pathological material. Bacteriological and serological diagnostics. Allergic diagnosis. Feature of immunity.<br>The causative agent of melioidosis. General characteristics. Material for research. Laboratory diagnostics (bacteriological and serological). Immunity. Used biological products |
| Section 19. Pathogenic mycoplasmas and chlamydia | Topic 19.1. History of discovery. Distribution in nature, significance in human and animal pathology. Classification of mycoplasmas and chlamydia. The causative agents of mycoplasmosis of farm animals and birds: pleuropneumonia of cattle, pleuropneumonia of goats, infectious agalactia of sheep and goats, respiratory mycoplasmosis of birds. The main types of chlamydiae - the causative agents of ornithosis, chlamydia of sheep, cattle and other animal species. Features of morphology, cultural and antigenic properties, the spectrum of pathogenicity. Resistance. The difference between mycoplasmas and L-forms of bacteria. Features of laboratory diagnosis in the study for mycoplasmosis and chlamydia. Immunity. Biopreparations. |
| Section 20. Pathogenic rickettsia | Topic 20.1. Discovery history. Significance in human and animal pathology. Ecology of rickettsia. The role of insect vectors in the distribution and circulation of rickettsia in nature. The main types of rickettsia and chlamydia - the causative agents of rickettsiases (Q fever, keratoconjunctivitis and cattle coudriosis, canine ehrlichiosis) Biological characteristics of rickettsia. |

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| | Spectrum of pathogenicity and resistance. Laboratory diagnostics of rickettsioses. Immunity. Specific prophylaxis. |
| Section 21. Causative agents of campylobacteriosis and leptospirosis | Topic 21.1. Causative agents of campylobacteriosis. Distribution and significance in the pathology of farm animals. Features of morphology and biological properties. Susceptibility of agricultural and laboratory animals. Campylobacter resistance. Laboratory diagnostics. Differentiation of pathogenic and saprophytic campylobacter.<br>Causative agents of leptospirosis. Distribution of pathogenic and saprophytic leptospira in nature. Significance in human and animal pathology. Features of morphology, cultural and pathogenic properties. Susceptibility of farm animals. Leptospira resistance to physical and chemical factors and in the environment. Laboratory diagnostics. Differentiation of leptospira. Application of PMA and RA for serological diagnosis of leptospirosis. Immunity in leptospirosis. Biologicals. |
| Section 22. Causative agents of mycoses and mycotoxicosis | Topic 22.1. The causative agents of mycoses (mucor, penicilli, aspergillus, etc.). Distribution in nature, importance in the pathology of farm animals and humans, biological properties of pathogens. Pathogenicity factors, resistance. Selection of material for research. Laboratory diagnostics of mold mycoses. Causative agents of mycoses caused by yeast-like fungi. Characteristics of the properties of the causative agents of candidiasis, coccidioidomycosis, epizootic lymphangitis, etc. The circle of susceptible animals. Selection of material for research. Laboratory diagnostics.<br>Causative agents of dermatomycosis. The susceptibility of animals. Morphology of pathogens of trichophytosis and microsporia. Selection of material for research. Laboratory diagnostics of dermatomycosis. Criteria for differentiation of pathogens of trichophytosis and microsporia. Biologicals. |
| Section 23. Causative agents of protozoal infections | Topic 23.1. Classification of protozoal animal diseases. General scheme of the development cycle of sporozoans. Causative agents of protozoal diseases of farm animals and birds: pyroplasmidosis of cattle and small ruminants, equids, dogs (piroplasmosis, babesiosis, nutalliosis, fransaiellosis), theileriosis of cattle, coccidiosis (eimeriosis, sarcocystosis, erythrocyte) , chickens, sarcocystosis of cattle and small ruminants, mastigophorosis (surra and equine disease), pig balantidiosis. Development cycles, sources of infections, localization of pathogens in the host's body, pathogenesis, prevention. |

| **Course title** | Virology and biotechnology |
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| **Course workload,** CU/ac.h. | 3/108 |
| **CONTENT OF THE DISCIPLINE** | |

| Sections | Topics |
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| 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 |

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| | 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 |
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| **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. |

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| 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. |

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| 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** | Breeding with the basics of private animal husbandry |
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| **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 |

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| | 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 |

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| | 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 |
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| **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 |
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| **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. |

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| 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 |
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| **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. |

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| | 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 |
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| **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** | Veterinary radiobiology |
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| **Course workload,** CU/ac.h. | 3/108 |
| **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 | Topic 2.1. Biological effects of ionizing radiation and safety precautions when working in radiation-contaminated areas |

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| 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** | Clinical diagnostics |
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| **Course workload,** CU/ac.h. | 7/252 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. General clinical | Topic 1.1 Introduction. |

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| diagnosis. | 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 |
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| **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 |
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| **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 |

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| | 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 ablasty. |
| | 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 |
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| **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 |
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| **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. |

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| | Topic 2.7 Poisoning Polychlorinated biphenyls and Polychlorinated biphenyls. |

| **Course title** | Obstetrics, gynecology and andrology |
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| **Course workload,** CU/ac.h. | 8/288 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. Gynecology and Andrology. | Topic 1.1 Introduction. Reproduction physiology. Ovogenesis. Spermiogenesis. |
| | 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 |
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| **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. |

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| | Topic 2.9. Diseases of birds. |
| | Topic 2.10. Diseases of fur-bearing animals. |

| **Course title** | General surgery |
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| **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 |
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| **Course workload,** CU/ac.h. | 4/144 |
| **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 |
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| **Course workload,** CU/ac.h. | 8/288 |
| **CONTENT OF THE DISCIPLINE** | |

| Sections | Topics |
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| 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. Helmintholarvoscopy, 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. |

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| **Course title** | Epizootology and infectious diseases |
| **Course workload,** CU/ac.h. | 10/360 |

| CONTENT OF THE DISCIPLINE | |
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| **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. Antiepizootic and preventive measures. | Topic 5.1. Principles of antiepizootic 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. |

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| | 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. Anthropozoonoses. |
| 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. |

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| **Course title** | Veterinary and sanitary examination |
| **Course workload,** CU/ac.h. | 6/216 |

| CONTENT OF THE DISCIPLINE | |
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| **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. |

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| | 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 modern conditions | Topic 1.1. Legislation on veterinary issues |
| 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 antiepizootic 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** | Forensic veterinary examination and dissection of animals |
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| **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. |

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| | 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** | Physical education |
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| **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. |

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| | 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** | Maths |
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| **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. |

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| 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 function | Topic 17.1 The concept of continuity of a function at a point and on an interval, the limits theorem, the first 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** | Russian language and culture of speech |
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| **Course workload,** CU/ac.h. | 2/72 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. Rhetoric as a Science and the Art of Eloquence | Topic 1.1. A brief history of the development of oratory.<br>- Orators of Ancient Greece and Rome: Cicero, Aristotle, Quintilian, Plato, Socrates, etc.<br>- Well-known orators of Russia.<br>- The rhetorical canon and modern eloquence.<br>- Stages of the classical rhetorical canon.<br>- Rhetoric in the professional sphere and public life of man of the information age.<br>- General and private rhetoric.<br>- Laws and principles of modern general rhetoric. |

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| | - Neorhetoric. |
| | Topic 1.2. Types of oratorical speeches.<br>- Classification of oratorical speeches according to their sphere of application: academic, eloquence social and political, social and domestic, spiritual, judicial.<br>- Their specificity, outstanding orators.<br>- Types of oratorical speeches by their target setting: epideictic speech, argumentative speech (persuasive and agitating) informing speech, entertaining speech |
| Section 2. Speech Impact and Persuasive Techniques | Topic 2.1. Methods, strategies and tactics of speech influence.<br>- Factors of speech influence.<br>- Communicative position and techniques to enhance it.<br>- Speech influence and manipulation. - Ways to overcome speech aggression. |
| | Topic 2.2. Types of methods of persuasion.<br>- Classification of methods of persuasion by the nature of the audience: universal and non-universal (contextual).<br>- Ways of universal argumentation: empirical argumentation, theoretical argumentation.<br>- Ways of theoretical argumentation logical argumentation, systematic argumentation, principled verifiability and principled rebuttability, condition of compatibility, methodological argumentation.<br>- 14 rules of persuasion: the rules of Homer, Socrates, Pascal, etc. |
| Section 3. Public Speaking | Topic 3.1. Features of public speaking.<br>- The main types of public speaking (in purpose and form). Their purpose, general characteristics, and specific features.<br>- Classification of audiences by volume and homogeneity. Specifics of how speakers work in auditoria of various types. Techniques for managing an audience. |
| | Topic 3.2. The main stages and principles of the preparation of public speaking (IDEMA).<br>- The composition of a speech. The role of the introduction. The structure of the main part of the speech. The final word.<br>- 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. |
| | Topic 3.3. The main functions of the speaker during a speech.<br>- 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. |
| Section 4. Communication in the structure of everyday and professional activities of a | Topic 4.1 Rhetoric of conversation.<br>- The structure of a conversation. Types of dialogic communication in a professional environment. Professional |

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| specialist | conversation, its types, content and structure of different types in situations of intraprofessional and interprofessional communication. |
| | Topic 4.2. Principles of conflict-free professional communication.<br>- Barriers to communication and overcoming them. Ability to listen and hear. Styles of listening. Principles of active listening. |
| | Topic 4.3. Strategies and tactics of discourse.<br>- Discourse in scientific and professional environment. Speech etiquette in a professional environment. |

| **Course title** | Introduction to the specialty |
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| **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. |

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| | Topic 2.11. Veterinary medicine in the post-war years. |

| **Course title** | Fundamentals of Economics and Management |
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| **Course workload,** CU/ac.h. | 2/72 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. Economics | Topic 1.1. Subject, method and tasks of economic science |
| | Topic 1.2. The Market Mechanism |
| | Topic 1.3. Factor markets |
| | Topic 1.4. Consumer behavior |
| | Topic 1.5 Theory of the Firm |
| Section 2. Management | Topic 2.1. Basics of management |
| | Topic 2.2. Interaction of the person and the organization |
| | Topic 2.3. The external and internal environment of the organization |
| | Topic 2.4 Designing an organization |

| **Course title** | Immunology |
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| **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** | General and Veterinary Ecology |
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| **Course workload,** CU/ac.h. | 2/72 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. General Ecology | Topic 1.1. The subject, tasks and structure of modern ecology. The subject of ecology, its structure, the tasks of ecology. History of the development of ecology as a science. The importance of environmental education at the present time. The main environmental problems of our |

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| | time. |
| | Topic 1.2 Outecology. The organism as a living holistic system. Levels of biological organization and ecology. Development of the organism as a living holistic system. The system of organisms and the Earth's biota. Concept of environmental factors. Classification. Abiotic factors. Biotic factors. Anthropogenic factors. Man's extermination of wild species. Concept of limiting factors. Adaptation of organisms to environmental factors. Life forms of organisms. Classification of life forms. Basic habitats. Water environment. Problem of fresh water scarcity. Terrestrial-air environment. Soil environment. Living organisms as habitat. Ecological features of parasites. |
| | Topic 1.3. Demecology. Population approach. The place of the population in the general structure of biological systems. Characteristics of populations. Dynamics of populations. Interactions between populations. Competition as a mechanism of emergence of ecological diversity. Predator-prey relationships. |
| | Topic 1.4. Synecology (biocenology). The concept of biocenosis. Species structure of biocenosis. Spatial structure of biocenosis. Trophic structure of biocoenosis. Mechanisms of maintaining spatial structure. Random, uniform and aggregative distribution of individuals. Ecological niche. General characteristics of ecological relationships. Types of relationships. |
| | Topic 1.5 Biogeocenology. The concept of ecosystem. Features of natural ecosystems. Dynamics of ecosystems. Ecological successions. Natural ecosystems of the Earth as chronological units of the biosphere. Classification of natural systems of the biosphere on a landscape basis. Terrestrial biomes. Freshwater ecosystems. Marine ecosystems. Integrity of the biosphere as a global ecosystem. Anthropogenic ecosystems. Man and ecosystems. Agricultural ecosystems and their features. Industrial and urban ecosystems. |
| | Topic 1.6. Biospherology. The biosphere as one of the Earth's envelopes. Composition and boundaries of the biosphere. Structure of the biosphere. Living matter of the biosphere. Circulation of substances in nature. Biogeochemical cycles of the most vital biogenic substances. Main directions of the biosphere evolution. V.I. Vernadsky's teaching about biosphere. Biological diversity as the basis for the biosphere's stability. Biosphere evolution. Noosphere as a new stage of biosphere's development. Laws of biogenic migration of atoms and irreversibility of evolution, laws of ecology. |
| | Topic 1.7. anthropogenic impact and environmental protection measures. Natural resources. Classification of natural resources. Natural resource potential. Natural |

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| | resource management. Rational use of natural resources. Classification of anthropogenic impacts. Concept of pollution. Forms of pollution. Sources of pollution. Consequences of pollution. Control of pollution. Composition of human environment. Laws of man-nature relations. Ways of solving environmental problems. Rational extraction and processing of natural mineral resources. Preservation and restoration of vegetation. Conservation and use of fauna. Red books. Specially protected natural areas. |
| | Topic 1.8 Environmental standards and regulations. The goals and objectives of environmental standards. The principles of environmental standardization. Norms of the quality of the environment. MPC. MPL. MPE. Methodological features of hygienic standardization |
| | Topic 1.9 Environmental monitoring and control. Monitoring: the concept and types. Environmental control. |
| | Topic 1.10. Resources of living things as an environmental factor. Resources of living things. Classification of resources. Ecological significance of irreplaceable resources. Ecological significance of food resources. |
| Section 2. Veterinary ecology | Topic 2.1. The use and protection of the agricultural landscape. Microflora of the post office. Interaction of pathogenic bacteria with protozoa. The system of integrated nature protection measures on the territory of the farm. |
| | Topic 2.2. Parasitism, pathogenicity and parasitic systems. Self-regulation of parasitic systems. The regulation of the number of pathogens in natural ecosystems. Classification of infectious diseases in connection with environmental factors. |
| | Topic 2.3 Ecology of microorganisms causing infectious diseases and conditionally pathogenic microflora. |
| | Topic 2.4. Ecological aspects of invasive diseases |
| | Topic 2.5. Gas-air emissions from livestock and poultry farms. Air microflora. The role of sanitary protection bottoms. Identification of pollutants in the air. |
| | Topic 2.6. Hydrotreatment facilities of livestock and residential areas. |
| | Topic 2.7. Utilization and decontamination of manure. Biological waste of animal origin. Manure decontamination. Disposal of biological waste. |

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| | Topic 2.8. State veterinary supervision for the safety of livestock products. Microflora of milk, meat and livestock products. Ecological certification of livestock and poultry farms. |

| **Course title** | Veterinary sanitation |
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| **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 |
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| **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. |

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| | 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 |
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| **Course workload,** CU/ac.h. | 3/108 |
| **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. |

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| 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. |

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| | 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** | Economics and organization of agricultural production |
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| **Course workload,** CU/ac.h. | 2/72 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. Economics and organization of production | Topic 1.1 Introduction to the discipline |
| | Topic 1.2 Placement, specialization and cooperation and integration in agriculture. |
| | Topic 1.3 The main resources of agricultural production. |
| | Topic 1.4 Production costs and pricing in agriculture. |
| Section 2. Economics of agricultural production | Topic 2.1 Manufacturing economics |
| | Topic 2.2 Economics of vegetable and potato production. |
| | Topic 2.3 Economics of feed production and use |
| | Topic 2.4 Economics of livestock industries |

| **Course title** | Foreign language |
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| **Course workload,** CU/ac.h. | 10/360 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1 Foreign Language | Topic 1.1. Grammar.<br>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.<br>Vocabulary and idioms.<br>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. |

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| Section 2. Foreign language for business communication | 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.<br>Communicative skills: Communication with English-speaking partners. Resolving conflict situations. Success in negotiations. Successful presentations. Understanding of the peculiarities of intercultural contacts. |

| **Course title** | Russian as a foreign language |
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| **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.<br>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.<br>The shape of the object.<br>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. |

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| 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. |
| | 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. |
| | 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. |
| Section 4. Life activity of a biological organism<br>And its characteristics | Topic 4.1. Types of process mechanisms. The emergence of a new object and its demise.<br>Formation of objects. Disappearance of objects. |
| | Topic 4.2. Changing the location of the object: the motion of the fluid.<br>Fluid motion. The nature and direction of motion. |
| | Topic 4.3. Changing the dynamics of the process. Process disruption and termination.<br>Process disruption.<br>Process termination. |
| | Topic 4.4. The role of the process. Evaluation of the process in terms of importance, significance. Process evaluation in terms of benefit/harm. |

| **Course title** | Applied physical education |
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| **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 |
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| **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 |

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| | course "Medicinal and poisonous plants. The history of the study of medicinal plants. |
| Section 2.<br>Basics of Botany | Topic 2.1. Basic concepts and definitions of botany.<br>- Sections and tasks of botany; directions, methods and basic concepts of botany. |
| | Topic 2.2. General characteristics of lower and higher plants:<br>- The main features of higher plants |
| Section 3.<br>Plant morphology | Topic 3.1. Root: concept, structure and functions.<br>- The functions of the root;<br>- Differentiation of the roots;<br>- metamorphosis of the root. |
| | Topic 3.2. The shoot as a single organ:<br>- the concept of the shoot and its functions;<br>- types of shoots; morphology of the shoot (nodes, internodes);<br>- metamorphosis of the shoot. |
| | Topic 3.3. Leaf.<br>- morphological structure and functions of the leaf;<br>- classification of leaves; types of leaf veins;<br>- leaf metamorphosis. |
| Section 4. Plant systematics | Topic 4.1. Plant systematics as a science.<br>- The concept of species in plants;<br>- The system of botanical taxonomic categories;<br>- lower and higher plants. |
| | Topic 4.2. Algae. Classification. The importance of algae in nature.<br>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.<br>- Division of flowering plants into classes. Comparative characteristics of monocotyledonous and dicotyledonous classes. |
| | Topic 4.6. Families of flowering plants. General characteristics of each family. Medicinal and poisonous plants of the families:<br>- Buttercups (Ranunculaceae);<br>- Rosaceae;<br>- Legumes (Fabaceae);<br>- Lamiaceae;<br>- Celery (Apiaceae);<br>- Solanaceae;<br>- Asteraceae;<br>- Liliaceae;<br>- Poaceae. |

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| Section 5. Medicinal plants. | Topic 5.1. General information about medicinal plants, their botanical characteristics. |
| | Topic 5.2. Physical, chemical and biological properties of biologically active substances. |
| | Topic 5.3. The content of the main biologically active substances in medicinal plants, the effect on the animal body; |
| | Topic 5.4. Technology of preparation and drying of raw materials and its chemical composition; |
| | Topic 5.5. Applications in medicine and veterinary medicine based on the latest achievements of science. |
| Section 6. Poisonous Plants. | Topic 6.1. General information about poisonous plants, their botanical characteristics. Prevention of poisoning. |
| | Theme 6.2 Main signs of poisoning by poisonous plants; - Ways to provide first aid in case of poisoning by poisonous plants; |
| | 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. |

| **Course title** | Fodder plants |
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| **Course workload,** CU/ac.h. | 2/72 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. Fundamentals of Botany | Topic 1.1. Basic concepts and definitions of botany.<br>- Sections and tasks of botany; directions, methods and basic concepts of botany. |
| | Theme 1.2 General characteristics of lower and higher plants:<br>- the main features of higher plants,<br>- the importance of plants in nature and human life;<br>- protection of the plant world. |
| Section 2. Plant Morphology | Topic 2.1. Root: concept, structure and functions.<br>- Root functions; root differentiation; root metamorphosis. |
| | Topic 2.2. The shoot as a single organ:<br>- the concept of the shoot and its functions;<br>- types of shoots; morphology of the shoot (nodes, internodes);<br>- metamorphosis of the shoot. |
| | Topic 2.3. Leaf.<br>- morphological structure and functions of the leaf;<br>- classification of leaves; types of leaf veins; |

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| | - leaf metamorphosis. |
| Section 3. Plant systematics | Topic 3.1. Plant systematics as a science.<br>- The concept of species in plants;<br>- phylogenetic systems of the plant world;<br>- system of botanical taxonomic categories; |
| | Topic 3.2. Division of the division of flowering plants into classes. Comparative characteristics of monocotyledonous and dicotyledonous classes.<br>- Characteristics of families on the example of major medicinal and fodder plants. |
| Section 4. Fodder plants. | Theme 4.1 General information about forage plants, their botanical characteristics.<br>- The content of the main biologically active substances in forage plants and their effect on the body of animals. |
| | Topic 4.2 General information about poisonous plants, their botanical characteristics. Prevention of poisoning.<br>- The main signs of poisoning by poisonous plants;<br>- methods of first aid in case of poisoning by poisonous plants. |

| **Course title** | Basics of Professional Ethics |
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| **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 | 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.<br>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.<br>Patriotism as a moral and political principle.<br>Friendship of peoples as a moral value, social and cultural reality. Friendship of Peoples as a moral and cultural priority at PFUR.<br>Main provisions of the PFUR teacher's Code of honor. Main Provisions of the PFUR Student Honor Code. |
| Section 2. Ethics as a philosophical science. | 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. |
| Section 3. History of Ethical Teaching. | Topic 3.1. The main schools of ethical knowledge. Ethical thought from Antiquity to modern society. Historical formation of professional ethics. |

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| Section 4. Professional Ethics and its Relationship to General Moral Theory. | 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. |
| Section 5. Professional Ethics in Different Spheres of Human Employment/ The Importance of Codes of Ethics in Modern Society. | 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. |

| **Course title** | Zoopsychology |
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| **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. |

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| | 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 |
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| **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** | Clinical laboratory diagnostics |
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| **Course workload,** CU/ac.h. | 2/72 |
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| **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 |
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| **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 diagnostics of the endocrine system. | Topic 4.1. Diagnosis of pathology of the endocrine glands (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 |

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| | of gastric juice. |
| | Topic 6.4. Coprology. Rules of sampling and laboratory examination of feces. |

| **Course title** | Organization of state veterinary supervision |
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| **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 basic |
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| **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).<br>SP 1.3.2322-08 Safety of work with microorganisms of III-IV pathogenicity groups<br>SP 2.6.1.2612-10 Basic sanitary rules for ensuring radiation safety<br>PND F 12.13.1-03 Methodical recommendations. Safety precautions when working in analytical laboratories general provisions.<br>Safety precautions for disinfection in laboratories of veterinary and sanitary examination.<br>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.<br>GOST R 51000.4-2011. National standard of the Russian Federation. General requirements for the accreditation of testing laboratories.<br>GOST ISO IEC 17025-2009. Interstate standard. General requirements for the competence of testing and calibration laboratories.<br>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 |

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| **Course title** | Biometrics in veterinary medicine |
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| **Course workload,** CU/ac.h. | 2/72 |
| **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 |
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| **Course workload,** CU/ac.h. | 2/72 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. Theoretical and methodological issues of business career management | Topic 1.1 Business career as a socio-economic category. |
| | Topic 1.2 Life plans and career. |
| | 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 |

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| 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 |
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| **Course workload,** CU/ac.h. | 2/72 |
| **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.<br>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. |

| **Course title** | Space technologies at the service of the agro-industrial complex |
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| **Course workload,** CU/ac.h. | 2/72 |
| **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 |

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| | 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 |
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| **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 |
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| **Course workload,** CU/ac.h. | 3/108 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. Differential diagnosis of diseases of productive | Topic 1.1. Methods of working with animal owners. |

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| animals. | 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. |

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| 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 |
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| **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.<br>Formation of objects. Disappearance of objects. |
| | Topic 1.2 Changes in the location of the object: the motion of a fluid.<br>Fluid motion. The nature and direction of motion. |
| | Topic 1.3 Changing the dynamics of the process. Process disruption and termination.<br>Process disruption.<br>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** | Diseases of small pets |
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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. |

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| | 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. |

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| | 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 |
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| **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. |

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| | 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. |

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| **Course title** | Fish pathology and aquaculture |

| **Course workload,** CU/ac.h. | 3/108 |
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| **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 diseases of fish | Topic 9.1 Saprolegniosis. |
| | 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 |
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| **Course workload,** CU/ac.h. | 3/108 |

| CONTENT OF THE DISCIPLINE | |
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| **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 |
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| **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. |

| **Course title** | Dermatology |
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| **Course workload,** CU/ac.h. | 3/108 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. Introduction to | Topic 1.1 Methods of skin research |

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| Dermatology | 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 |
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| **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 |
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| **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 |
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| **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.<br>Semiotics of kidney diseases.<br>Assessment of the functional state of the kidneys. |
| Section 2. Kidney diseases. | Topic 2.1. Glomerulonephritis, pyelonephritis, kidney |

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| | damage in metabolic diseases. |
| | Topic 2.2. Secondary nephropathies, congenital and hereditary nephropathies. |

| **Course title** | Reconstructive surgery |
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| **Course workload,** CU/ac.h. | 2/72 |
| **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 |
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| **Course workload,** CU/ac.h. | 2/72 |
| **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 |

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| | 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 ablasty. |
| | 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 |
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| **Course workload,** CU/ac.h. | 2/72 |
| **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. |

| **Course title** | Foreign language for special purposes |
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| **Course workload,** CU/ac.h. | 3/108 |
| **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 |

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| | 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. |

| **Course title** | Russian language for special purposes |
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| **Course workload,** CU/ac.h. | 3/108 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. Animal diseases and their characteristics | Topic 1.1. General characteristics of the disease.<br>The condition of the disease.<br>The cause of the pathological condition.<br>Classification of diseases. |
| | Topic 1.2. Clinical picture of the disease: disorders of thermal regulation. Types of symptoms. Symptoms and syndromes. Typical symptoms of the disease. Duration of symptom. Recurrence of the symptom. |
| | Topic 1.3. Clinical picture of the disease: digestive disorders. Pain as the main symptom of the disease. Nature of pain. Severity of pain. Duration of pain. Periodicity of pain. Localization of pain. Pain control. |
| | Topic 1.4. Clinical picture of the disease: metabolic disorders. Additional symptoms of the disease. Types of additional symptoms. Characteristics of additional symptoms. |

| **Course title** | Foreign language. Translation of special texts |
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| **Course workload,** CU/ac.h. | 3/108 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. Foreign Language (advanced level) | Topic 1.1. Regional anatomy of the abdomen I. Reading, interpreting, abstracting the article, selection of basic terminological units, translation analysis of the text. |
| | Topic 1.2. Regional anatomy of the abdomen II. Reading, interpreting, abstracting the article, selection of basic terminological units, translation analysis of the text. |
| | Topic 1.3. Clinical examination I. Reading, interpreting, abstracting the article, highlighting the main terminological units, translation analysis of the text. |
| | Topic 1.4. Clinical examination II. Reading, interpreting, abstracting the article, identifying the main terminological units, translation analysis of the text. |

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| | Topic 1.5. Clinical examination III. Reading, interpreting, abstracting the article, identifying the main terminological units, translation analysis of the text. |
| | Topic 1.6. Clinical examination IV. Reading, interpreting, abstracting the article, identifying the main terminological units, translation analysis of the text. |
| | Topic 1.7. Clinical examination V. Reading, interpreting, abstracting the article, highlighting the main terminological units, translation analysis of the text. |
| Section 2. Foreign language of professional communication | Topic 2.1. Animal pathology I. Reading, interpreting, abstracting the article, highlighting the main terminological units, translation analysis of the text. |
| | Topic 2.2. Animal pathology II. Reading, interpreting, abstracting the article, highlighting the main terminological units, translation analysis of the text. |
| | Topic 2.3. Animal pathology III. Reading, interpreting, abstracting the article, highlighting the main terminological units, translation analysis of the text. |
| | Topic 2.4. Animal pathology IV. Reading, interpreting, abstracting the article, highlighting the main terminological units, translation analysis of the text. |

| **Course title** | Russian language. Translation of special texts |
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| **Course workload,** CU/ac.h. | 3/108 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. Translation: the essence, functions, and specificity | Topic 1.1. Subject matter, objectives and methods of translation theory. Translation theory as a scientific discipline. The essence and specificity of translation. The place, role and functions of translation in professional communication of specialists. |
| Section 2. Current problems of the theory of translation and their role in optimizing translation practice. | Topic 2.1. The concept of translation activity, professional translation competence. Problems of the quality of written professional translation. Factors affecting the quality of translation. Problems of quality of written professional translation. Factors affecting the quality of translation. |
| Section 3. Moral and Ethical Foundations and Requirements for the Professional Translator | Topic 3.1. The concepts of "ethics", "morality", "morality". Moral code of a translator. IMIA code of ethics. Ethics and etiquette, ethics and law in written mediation. |
| Section 4. Typical situations in written mediative communication | Topic 4.1. Types of translation in the context of the goals and conditions of the written translation activity. The "author factor" of the source text. The "addressee factor". |
| Section 5. Professionally-oriented text/discourse and its genres as an object of translation | Topic 5.1. Mastering the genres of professionally oriented text/discourse in translation: scientific text; popular science text; instruction; advertising text; business letter. Mastering the genres of documentation in written professional translation: supporting documents; documents for insurance companies; translation of the results of clinical |

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| | studies, extracts, medical history, CPR (certificates of pharmaceutical products), GMP (rules of production organization and quality control of medicines), epicrisis, expert conclusions, documentation of equipment and instruments. |
| Section 6. External tools (resources) of the translation activity. Strategies and techniques of information retrieval | Topic 6.1. Classification of translator's aids: dictionaries, encyclopedias, electronic sources, Internet resources, analogue texts. Translation and dictionaries. The role of dictionaries in the translator's work. A general concept of the typology of dictionaries. Algorithm of translator's actions, using different types of dictionaries to solve different translation problems. Bilingual dictionary; inadmissibility of using outdated dictionaries. A monolingual explanatory dictionary. Dictionary of collocations/combinations. Bilingual and monolingual phraseological dictionary (idiom dictionary). Dictionary of neologisms. Special terminological dictionaries. Specialized dictionaries. Dictionary of personalities. Encyclopaedic dictionaries and reference books. Strategies and techniques of information retrieval. |
| Section 7. Electronic support for professionally-oriented translation activities | Topic 7.1. Technical means of translation. Using machine translation in the work with professionally oriented text/discourse.<br>Electronic dictionaries and reference books: types, working strategies. Websites on specialized disciplines, their use in translation. Principles and software tools for effective terminology retrieval. |
| Section 8. Intercultural Aspects of Translation | Topic 8.1. Translation as a process of mediated intercultural interlingual communication.<br>The problem of translatability. Language picture of the world and translation.<br>The concept of linguistic picture of the world: language, culture, mentality. The translator as an intermediary (mediator) in intercultural communication. Difficulties of translation at different levels of language due to cultural differences. |
| Section 9. Linguistic aspects of translation. Lexical-semantic and grammatical transformations | Topic 9.1. Transmission of pragmatic meanings. Classification of types of pragmatic meanings (L. S. Barkhudarov). The role of pragmatic meanings in the translation process. The pragmatic aspect of translation.<br>Transmission of intralinguistic meanings. Grammatical meanings in translation. Difficulties associated with the divergence of grammatical systems of native and foreign languages. Transfer of syntactic meanings.<br>Context and situation in translation. Concepts of microcontext and macrocontext. The role of context in resolving polysemy. Syntactic context. Lexical context. Vocabulary that provokes translation errors. "Translator's false friends". The extralinguistic situation. Translation of abbreviations.<br>Translation transformations. Types of translation transformations according to L.S. Barkhudarov: |

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| | permutations; replacements (grammatical, lexical): replacement of word forms, replacement of parts of speech; replacement of sentence members syntactic replacements in a complex sentence (replacement of a simple sentence with a complex, replacement of a complex sentence with a simple one, replacement of the main sentence with a noun and vice versa, replacement of subordination with composition, replacement of union by non-union); lexical replacements (concretization, generalization, replacement of the effect by cause and cause by effect), antonymic translation. Additions. Omissions. |
| Section 10. Stylistic aspects of translation. Editing the text of the translation | Topic 10.1 Stylistic features of texts of different genres. The equivalentless vocabulary. Methods of translation of non-equivalent vocabulary (transliteration and transcription; calibration; descriptive translation; approximate translation; transformational translation).<br>Strategies and tactics for editing the text of translation, ways and means of preventing and correcting errors in written translation. |

| **Course title** | Foreign language. Professional communications |
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| **Course workload,** CU/ac.h. | 4/144 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |
| Section 1. Professional and practical activity<br>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** | Russian language. Professional communications |
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| **Course workload,** CU/ac.h. | 4/144 |
| **CONTENT OF THE DISCIPLINE** | |
| **Sections** | **Topics** |

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| Section 1. Written scientific and professional communication, Reading and annotating scientific articles on veterinary medicine | Topic 1.1. Features of the written scientific text. The specifics of written scientific and professional speech in comparison with oral. Linguistic features of scientific style of speech. Varieties of scientific written texts. |
| | Topic 1.2. Meaningful analysis of the written scientific text. Highlighting the topic and the main idea of the text. Highlighting the key points. Differentiation of the main and secondary information. Identification of conceptual information. Interpretation of conceptual information. |
| | Topic 1.3. Annotation: a brief characteristic. The concept of annotation, purpose, genre features and types of annotations: reference, advisory, specialized. |
| | Topic 1.4. Structure, content, features of the abstract. General requirements for writing an abstract. The content of the abstract, the volume of the abstract. Linguistic peculiarities of the annotation. |
| | Topic 1.5 Annotation algorithm for scientific articles on veterinary medicine. Speech clichés for writing abstracts. Writing an abstract. Typical mistakes when writing an abstract. Analysis of examples of abstracts. |
| Section 2. Reading and abstracting scientific articles on veterinary medicine | Topic 2.1. Abstracting: the main features. The concept of the abstract, its purpose and the main genre features, the purpose of the abstract. Types of abstracts. The essence and methods of compression of the material of the primary source. |
| | Topic 2.2. The structure, content, features of the abstract. General requirements for writing an abstract. The composition of the abstract. Linguistic features of the composition of the abstract. |
| | Topic 2.3 Algorithm of abstracting scientific articles on veterinary medicine. Fragmentation of the text. Identification of the main idea and arguments to support it. Speech clichés for writing essays. Writing an abstract based on one source / several sources. Typical mistakes when writing an essay. Analysis of examples of essays. |

**HEAD OF THE HIGHER EDUCATION PROGRAM:**

Director of the Department of Veterinary Medicine _____ Vatnikov Yu.A.

Position, Basic curriculum Signature Full name