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**Federal State Autonomous Educational Institution for Higher Education PEOPLES'
FRIENDSHIP UNIVERSITY OF RUSSIA
Agrarian and Technological Institute**

WORKING COURSE SYLLABUS

General and Veterinary Ecology

Recommended by the Methodological Council for the Education Field:

36.05.01 Veterinary medicine

2022 г.

1. GOALS AND OBJECTIVES OF THE DISCIPLINE

The aim of mastering the discipline "**General and Veterinary Ecology**" is to form students' environmental thinking, improve environmental literacy, familiarity with the real environmental situation in the country. The objectives of the discipline - to form an understanding of the essence of modern environmental problems, the causes of the negative impacts of industrial activities on natural complexes and components.

2. REQUIREMENTS FOR THE RESULTS OF MASTERING THE DISCIPLINE

The development of the discipline "**General and Veterinary Ecology**" is aimed at creating the following competencies (parts of competencies) for students:

Table 2.1. List of competencies formed by students during the development of the discipline (results of the development of the discipline)

Code	Competence	Indicators of competence accomplishment (within the discipline)
UK -8	The ability to create and maintain safe living conditions in everyday life and in professional activities for the preservation of the natural environment, ensuring the sustainable development of society, including in the event of a threat and occurrence of emergencies and military conflicts.	UK-8.1 Analyzes the factors of harmful influence on the vital activity of elements of the habitat. (technical means, technological processes, materials, buildings and structures, natural and social phenomena);
		UK -8.2 Identifies dangerous and harmful factors within the scope of the task being performed;
		UK-8.3 Identifies and eliminates problems related to safety violations in the workplace;
		UK-8.4 Explains measures to prevent emergencies;
		UK -8.5 "Explains the rules of conduct in the event of emergencies of natural and man-made origin, as well as in the event of military conflicts;"
		UK-8.6 Provides first aid, participates in recovery activities.
GPC-2	The ability to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological state of the animal organism.	GPC-2.1 Has knowledge of the influence of natural, socio-economic, genetic and economic factors on the animal body.
		GPC-2.2 He is able to establish the presence and reliability of cause-and-effect relationships between the effects of certain etiological factors on the animal's body and the development of diseases.
		GPC-2.3 Possesses methods of preventive and curative correction of the effects of adverse environmental factors that can

		cause deterioration of animal health.
GPC-3	The ability to carry out and improve professional activities in accordance with regulatory legal acts in the field of agro-industrial complex.	<p>GPC-3.1 He knows modern legal norms, both state and international, regulating activities in the field of veterinary medicine, veterinary and sanitary expertise and agro-industrial complex.</p> <p>GPC-3.2 Has the skills of updating legal information, including in the field of agro-industrial complex of professional orientation.</p> <p>GPC-3.3 Carries out activities in accordance with regulatory legal acts in the field of agriculture, as well as in the field of veterinary medicine and veterinary and sanitary expertise.</p>
GPC -6	The ability to analyze, identify and assess the risk of the risk of the occurrence and spread of diseases.	<p>GPC-6.1 Has knowledge in the field of etiology and pathogenesis of animal diseases of different species.</p> <p>GPC-6.2 Has the skills to diagnose non-infectious, infectious and invasive diseases, identify pathogens of infectious and invasive diseases in animals.</p> <p>GPC-6.3 He knows the patterns of the occurrence and spread of diseases in animal populations, factors predisposing to diseases and the causes of possible complications.</p>
PC -22	Ability to organize measures to protect the organization from the introduction of infectious and invasive diseases in accordance with the plan of antiepidemiological measures.	<p>PC -22.1 He is able to assess the epizootic state of an organization (territory), identify risks and possible causes of epizootic foci, as well as factors affecting their spread in specific organizations, territories.</p> <p>PC-22.2 Able to choose and apply the most effective measures to protect the organization from the introduction of infectious and invasive diseases.</p> <p>PC-22.3 He is able to carry out operational control of the effectiveness of the activities carried out.</p>
PC -24	Ability and willingness to promote veterinary knowledge, including in the field of prevention of animal diseases.	<p>PC-24.1 He is able to set goals in the field of veterinary knowledge promotion, plan the strategy and tactics of upcoming events.</p> <p>PC-24.2 He is able to use computer and telecommunication facilities for the preparation and demonstration of materials used in the process of promoting</p>

		veterinary knowledge.
		PC-24.3 He is able to conduct conversations, lectures, seminars for employees of the organization in order to explain the principles of work on the prevention of animal diseases.

3. COURSE IN HIGHER EDUCATION

The discipline "**General and Veterinary Ecology**" refers to the mandatory part of block B1 of the Educational Program of Higher Education.

As part of the Educational Program of Higher Education, students also master other disciplines and /or practices that contribute to achieving the planned results of mastering the discipline "**General and Veterinary Ecology**".

Table 3.1. List of Higher Education Program components disciplines that contribute to expected learning outcomes

Competence code	Competence	Previous Disciplines (Modules)	Subsequent Disciplines (Modules)
UK -8	The ability to create and maintain safe living conditions in everyday life and in professional activities for the preservation of the natural environment, ensuring the sustainable development of society, including in the event of a threat and occurrence of emergencies and military conflicts.	History Inorganic and analytical chemistry Organic chemistry Biological physics Physical and Colloidal Chemistry Life safety Biological chemistry Veterinary Microbiology and Mycology Virology and biotechnology Veterinary radiobiology Parasitology and invasive diseases Epizootology and infectious diseases Organization of veterinary affairs	Veterinary sanitation Veterinary deontology Laboratory diagnostics of infectious and invasive diseases Organization of state veterinary supervision
GPC-2	The ability to interpret and evaluate in professional activity the influence of	Biology with the basics of ecology Veterinary genetics Veterinary Microbiology and	Veterinary sanitation Fodder plants Zoopsychology Здоровье и благополучие

	natural, socio-economic, genetic and economic factors on the physiological state of the animal organism.	<p>Mycology Virology and biotechnology Physiology and ethology of animals Breeding with the basics of private animal husbandry Animal health and welfare Pathological physiology Veterinary radiobiology Pathological anatomy Instrumental diagnostic methods Toxicology Obstetrics, gynecology and andrology Internal diseases General surgery Private Veterinary Surgery Parasitology and invasive diseases Epizootology and infectious diseases Forensic veterinary examination and dissection of animals Immunology</p>	<p>ЖИВОТНЫХ Horse diseases Diseases of Productive Animals Diseases of small pets Болезни мелких домашних животных Diseases of bees and entomophages Fish pathology and aquaculture Diseases of exotic animals Anesthesiology, resuscitation and intensive care Dermatology Cardiology Endocrinology Nephrology Veterinary ophthalmology Animal Dentistry</p>
GPC-3	The ability to carry out and improve professional activities in accordance with regulatory legal acts in the field of agro-industrial complex.	<p>Law science Life safety Breeding with the basics of private animal husbandry Veterinary pharmacology Toxicology Parasitology and invasive diseases Epizootology and infectious diseases Organization of veterinary affairs</p>	<p>Veterinary sanitation Processing technology for livestock products Veterinary deontology Economics and organization of agricultural production Laboratory diagnostics of infectious and invasive diseases Organization of state veterinary supervision Veterinary and industrial laboratories with design basics Career management</p>

			Basics of social and legal knowledge
GPC -6	The ability to analyze, identify and assess the risk of the risk of the occurrence and spread of diseases.	Biology with the basics of ecology Life safety Veterinary Microbiology and Mycology Virology and biotechnology Animal health and welfare Feeding animals with the basics of forage production Veterinary radiobiology Clinical diagnostics Pathological anatomy Instrumental diagnostic methods Toxicology Obstetrics, gynecology and andrology Internal diseases General surgery Private Veterinary Surgery Parasitology and invasive diseases Epizootology and infectious diseases Veterinary and sanitary examination Organization of veterinary affairs Forensic veterinary examination and dissection of animals Introduction to the specialty	Veterinary sanitation Processing technology for livestock products Medicinal and poisonous plants Fodder plants Animal health and welfare Clinical laboratory diagnostics Laboratory diagnostics of infectious and invasive diseases Organization of state veterinary supervision Horse diseases Diseases of Productive Animals Diseases of small pets Болезни мелких домашних животных Diseases of bees and entomophages Fish pathology and aquaculture Diseases of exotic animals Anesthesiology, resuscitation and intensive care Veterinary ophthalmology Animal Dentistry
PC -22	Ability to organize measures to protect the organization from the introduction of infectious and invasive diseases in	Life safety Veterinary Microbiology and Mycology Virology and biotechnology Animal health and	Veterinary sanitation Processing technology for livestock products Laboratory diagnostics of infectious and invasive diseases Organization of state

	accordance with the plan of antiepidemiological measures.	welfare Veterinary pharmacology Private Veterinary Surgery Parasitology and invasive diseases Epizootology and infectious diseases Organization of veterinary affairs	veterinary supervision Diseases of bees and entomophages Fish pathology and aquaculture Здоровье и благополучие ЖИВОТНЫХ
PC -24	Ability and willingness to promote veterinary knowledge, including in the field of prevention of animal diseases.	Physiology and ethology of animals Breeding with the basics of private animal husbandry Animal health and welfare Feeding animals with the basics of forage production Pathological physiology Pathological anatomy Toxicology Obstetrics, gynecology and andrology Internal diseases General surgery Private Veterinary Surgery Parasitology and invasive diseases Epizootology and infectious diseases Basics of Rhetoric and Communication Introduction to the specialty	Veterinary sanitation Veterinary deontology Economics and organization of agricultural production Medicinal and poisonous plants Fodder plants Zoopsychology Здоровье и благополучие ЖИВОТНЫХ Horse diseases Diseases of Productive Animals Diseases of small pets Болезни мелких домашних животных Diseases of bees and entomophages Fish pathology and aquaculture Diseases of exotic animals Dermatology Cardiology Endocrinology Nephrology Reconstructive surgery Veterinary ophthalmology Animal Dentistry Foreign language for special purposes Russian language for special purposes Foreign language.

			Translation of special texts Russian language. Translation of special texts Foreign language. Professional communications Russian language. Professional communications
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4. COURSE WORKLOAD AND TRAINING ACTIVITIES

Course workload of the discipline "General and Veterinary Ecology" is 2 credits.

Table 4.1. Types of academic activities during the period of the HE program mastering for **full-time** study

Types of academic activities		HOURS	Semesters				
			5	-	-	-	
Contact academic hours		36	36	-	-	-	
including							
Lectures		-	-	-	-	-	
Lab work		-	-	-	-	-	
Seminars (workshops/tutorials)		36	36	-	-	-	
Self-study		24	24	-	-	-	
Evaluation and assessment (exam/pass/fail grading)		12	12	-	-	-	
Course workload		Academic hour	72	72	-	-	-
		Credit unit	2	2	-	-	-

Table 4.2. Types of academic activities during the period of the HE program mastering for **part-time** study

Types of academic activities		HOURS	Semesters			
			5	-	-	-
Contact academic hours		18	18	-	-	-
including						
Lectures		-	-	-	-	-
Lab work		-	-	-	-	-
Seminars (workshops/tutorials)		18	18	-	-	-
Self-study		44	44	-	-	-
Evaluation and assessment (exam/pass/fail grading)		10	10	-	-	-

Course workload	Academic hour	72	72	-	-	-
	Credit unit	2	2	-	-	-

5. CONTENT OF THE DISCIPLINE

Table 5.1 Content of the discipline (module) by type of academic work

Name of the discipline section	Content of the section (topics)	Types of academic activities
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 time.	Seminar classes
	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.	Seminar classes
	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.	Seminar classes
	Topic 1.4. Synecology (biocenology). The concept of biocenosis. Species	Seminar classes

	<p>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.</p>	
	<p>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.</p>	<p>Seminar classes</p>
	<p>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.</p>	<p>Seminar classes</p>
	<p>Topic 1.7. anthropogenic impact and environmental protection measures. Natural resources. Classification of natural resources. Natural resource potential. Natural resource management. Rational use of natural resources.</p>	<p>Seminar classes</p>

	<p>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.</p>	
	<p>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</p>	Seminar classes
	<p>Topic 1.9 Environmental monitoring and control. Monitoring: the concept and types. Environmental control.</p>	Seminar classes
	<p>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.</p>	Seminar classes
Section 2. Veterinary ecology	<p>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.</p>	Seminar classes
	<p>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.</p>	Seminar classes
	<p>Topic 2.3 Ecology of microorganisms causing infectious diseases and conditionally pathogenic microflora.</p>	Seminar classes
	<p>Topic 2.4. Ecological aspects of invasive diseases</p>	Seminar classes

	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.	Seminar classes
	Topic 2.6. Hydrotreatment facilities of livestock and residential areas.	Seminar classes
	Topic 2.7. Utilization and decontamination of manure. Biological waste of animal origin. Manure decontamination. Disposal of biological waste.	Seminar classes
	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.	Seminar classes

6. CLASSROOM INFRASTRUCTURE AND TECHNOLOGY SUPPORT REQUIREMENTS

Table 6.1. Material and technical support of the discipline

<i>Classroom for Academic Activity Type</i>	<i>Equipping the classroom</i>	Specialized educational/laboratory equipment, software and materials for the development of the discipline (if necessary)
Lecture	An auditorium for conducting lecture-type classes, equipped with a set of specialized furniture; a board (screen) and technical means of multimedia presentations.	-
Self-studies	An auditorium for independent work of students (can be used for seminars and consultations), equipped with a set of specialized furniture and computers with access to an electronic information and educational environment.	-

7. RECOMMENDED SOURCES FOR COURSE STUDIES

Main reading:

1. Mosina L.V. Ecology (modular course) : textbook for higher educational

- institutions of agronomic and agrotechnological profile / L.V. Mosina, E.A. Dovletyarova. - Moscow : PFUR, 2020. - 121 c.
2. Mitina N.N. Ecology : textbook and practical work for academic baccalaureate / N.N. Mitina, B.M. Malashenkov; Ed. by V.I. Danilov-Danilyan. - M. : Yurite, 2018. - 363c.
 3. Sakhno NV, Timokhin OV, Vatnikov SA, Tutkyshbay IA Fundamentals of general and veterinary ecology. Technogenic diseases of animals: a training manual / Ed. by N.V. Sakhno. - Sb.: Publishing house "Lan", 2017. - 372 c.

Additional Reading:

1. Kislenko V.N. General and veterinary ecology : textbook / V.N. Kislenko, N.A. Kalinenko. - Moscow : INFRA-M, 2020. - 344 c.
2. Potapov A.D. Ecology. - Moscow : High School, 2000.
3. Polischuk Y.M. General Ecology. - Khanty-Mansiysk: Publishing house of YuGU, 2004.
4. General ecology: textbook for high schools / author-compiler A.S. Stepanovskikh. - COMPILED BY A.S. STEPANOVSKIKH. M.: UNITY-DANA, 2000. - 510 c.
5. Reimers N.F. Nature Management: Dictionary-Reference Book. - Moscow: Mysl, 1990. - 637 c.
6. Ecology, Nature Conservation, Ecological Safety: Textbook / edited by A.T. Nikitin and S.A. Stepanov. MEPU, 2000.

Resources of the Internet information and telecommunication network:

1. Electronic library system of RUDN and third-party Electronic library systems to which university students have access on the basis of concluded contracts:
 - Electronic library system of RUDN - ELS RUDN <http://lib.rudn.ru/MegaPro/Web>
 - ELS "University Library online" <http://www.biblioclub.ru>
 - ELS Yurayt <http://www.biblio-online.ru>
 - ELS "Student Consultant" www.studentlibrary.ru
 - ELS "Lan" <http://eZlanbook.com/>
 - ELS "Trinity Bridge" <http://www.trmost.com/>
2. Databases and search engines:
 - electronic fund of legal and regulatory and technical documentation <http://docs.cntd.ru/>
 - search engine Yandex <https://www.yandex.ru/>
 - search engine Google <https://www.google.ru/>
 - abstract database SCOPUS <http://www.elsevierscience.ru/products/scopus/>

Educational and methodological materials for independent work of students during the development of the discipline/ module*:

 1. A course of lectures on the discipline "**General and Veterinary Ecology**".
 2. Seminary workshop on the discipline "**General and Veterinary Ecology**".

* - All educational and methodological materials for independent work of students are placed in accordance with the current procedure on the discipline page in the **Telecommunication educational and Information System!**

8. MID-TERM ASSESSMENT

Evaluation materials and a point-rating system* for assessing the level of competence formation (part of competencies) based on the results of mastering the discipline "**General and Veterinary Ecology**" are presented in the Appendix to this Work Program of the discipline.

* - Assessment Materials and a Point Rating System are formed based on the requirements of the relevant local regulatory act of the RUDN.

DEVELOPER:

Associate Professor in the Department of Technical
and Environmental Safety

Position, Basic curriculum

Signature

Khairova N.I.

Full name.

HEAD OF THE DEPARTMENT:

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HEAD OF THE HIGHER EDUCATION PROGRAM:

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