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Pe Federal State Autonomous Educational Institution of Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA
RUDN University

Agrarian and Technological Institute

educational division (faculty/institute/academy) as higher education programme developer

COURSE SYLLABUS

Agroecology

course title

Recommended by the Didactic Council for the Education Field of:

36.05.01 Veterinary

field of studies / speciality code and title

The course instruction is implemented within the professional education programme of higher education:

Agroecology

higher education programme profile/specialisation title

1. COURSE GOAL(s)

The goal of the course "**Agroecology**" is to acquire in-depth knowledge and skills necessary for sustainable management of agroecosystems that contribute to the conservation of natural resources, improve environmental quality and increase food security. All this is necessary for the proper application of their knowledge in the development of sustainable production methods, analysis and assessment of environmental risks, and more.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the course "**Agroecology**" is aimed at creating the following competencies (parts of competencies) for students:

Table 2.1. List of competences that students acquire through the course study

Competence code	Competence descriptor	Competence formation indicators (within this course)
GPC-2	The student is able to interpret and evaluate in his professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological state of the animal body.	GPC-2.1 The student has knowledge about the influence of natural, socio-economic, genetic and economic factors on the animal body.

3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The course "**Agroecology**" refers to the core part of block B1 of the Educational Program of Higher Education.

Within the higher education programme students also master other (modules) and / or internships that contribute to the achievement of the expected learning outcomes as results of the course study.

Table 3.1. The list of the higher education programme components/disciplines that contribute to the achievement of the expected learning outcomes as the course study results

Competence code	Competence descriptor	Previous courses/modules, internships*	Subsequent courses/modules, internships*
GPC-2	The student is able to interpret and evaluate in	History of Russia, Maths, History of Religions	Obstetrics, Gynecology and Andrology,

	his professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological state of the animal body.	in Russia, Fundamentals of Russian Statehood, Basic Military Training. Life Safety, Digital Literacy, Law Science, Philosophy, Physical Education, Inorganic and Analytical Chemistry, Organic Chemistry, Biology with Basic Ecology, Biophysics, Physical and Colloidal Chemistry, Biological Chemistry, Anatomy of Animals, Latin language, Cytology, Histology and Embryology, Veterinary Microbiology and Mycology, Virology and Biotechnology, Physiology and Ethology of Animals, Animal Breeding with Basics of Private Husbandry, Animal Health and Welfare, Animal Nutrition and Feeding with Basics of Feed Production, Pathologic Physiology, Veterinary Pharmacology, Clinical Diagnostics, Pathological Anatomy,	Internal Diseases, General Surgery, Private Surgery, Parasitology and Invasive Diseases, Epidemiology and Infectious Diseases, Veterinary and Sanitary Expertise, Organization of Veterinary Management with the Basics of Project Activities, Veterinary Sanitation, Technology of Animal Products Processing, Veterinary Deontology, Laboratory Diagnostics with Elements of Artificial Intelligence Technology, Organization of State Veterinary Supervision, Forensic Veterinary Examination and Necropsy, Biometrics, Biostatistics and Data Analysis in Veterinary Medicine, Professional Foreign Language, Professional Russian Language, Equine Diseases, Diseases of Farm Animals, Small Animal Diseases, Bee Diseases and Entomophages, Exotic Animal
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		Operative Surgery with Topographic Anatomy, Instrumental Diagnostic Methods with Elements of Artificial Intelligence Technology, Toxicology, Foreign Language, Russian as a Foreign Language, Russian Language and Culture of Speech, Introduction to Specialty, Political science, Immunology, Veterinary Genetics, Veterinary Radiobiology, Applied Physical Education, Medicinal and Poisonous Plants, Fodder Plants, Zoopsychology, Animal Health and Welfare, Veterinary Assistant Skills, Fish Pathology and Aquaculture, Educational Practice	Disease, Dermatology, Cardiology, Endocrinology, Oncology, Neurology, Nephrology, Anesthesiology, Resuscitation And Intensive Therapy, Reconstructive Surgery, Veterinary Ophthalmology, Behavioral Medicine, Animal Dentistry, Clinical Industrial Practice, Preparation for Passing and Passing the State Exam, Preparing and Passing the State Exam, Design, Preparation for Defense Procedure and Defense of the Graduation Thesis, Russian Language for Foreign Students, Clinical Internship Industrial Research Practice
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4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the course "**Agroecology**" is 2 credits.

*Table 4.1. Types of academic activities during the periods of higher education programme mastering (**full-time training**)**

Type of academic activities	Total academic hours	Semesters/training modules			
		6	7	8	-
Contact academic hours	102	34	-	-	-

including						
Lectures		34	34	-	-	-
Lab work		-	-	-	-	-
Seminars (workshops/tutorials)		34	34	-	-	-
Self-study		-	-	-	-	-
Evaluation and assessment (exam/pass/fail grading)		4	4	-	-	-
Course workload	academic hours_	72	72	-	-	-
	credits	2	2	-	-	-

5. COURSE CONTENTS

Table 5.1. Course contents and academic activities types

Course module title	Course module contents (topics)	Academic activities types
Module 1. Introduction	Topic 1.1. Course is a system of knowledge about the internal and external structure of the body.	Lectures, Lab work.
Module 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.	Lectures, Lab work.
	Topic 2.2. Axial skeleton.	Lectures, Lab work.
	Topic 2.3. The skeleton of the head. - The facial part of the skull. - The cerebral part of the skull.	Lectures, Lab work.
	Topic 2.4. Musculoskeletal system. - Thoracic limbs and their girdle. - Pelvic limbs and their girdle.	Lectures, Lab work.
	Topic 2.5. Bone connection (arthrosyndesmology) - Morphofunctional characteristics of bone junctions, their classification and morphogenesis.	Lectures, Lab work.
Module 3. Muscular system (myology)	Topic 3.1. Muscle as an organ, morphogenesis of the muscular system.	Lectures, Lab work.
	Topic 3.2. Classification of muscles. - By origin, form, internal architectonics, function, topographical feature.	Lectures, Lab work.

	Topic 3.3. Muscles of the axial skeleton. - Filo- and ontogenesis of the muscles of the axial department. Muscles and fascia of the neck, trunk and tail.	Lectures, Lab work.
	Topic 3.4. Muscles of the shoulder girdle and spinal column. - Dorsal muscles of the shoulder girdle and vertebral column. Ventral muscles of the neck, lower back, tail.	Lectures, Lab work.
	Topic 3.5. Chest muscles. - Inhaler muscles, exhalator muscles and diaphragm.	Lectures, Lab work.
	Topic 3.6. Abdominal wall muscles.	Lectures, Lab work.
	Topic 3.7. Head muscles. - Philo- and ontogenesis. Facial and masticatory muscles. Muscles of the sublingual apparatus.	Lectures, Lab work.
	Topic 3.8. Limb muscles. - Philo and ontogenesis.	Lectures, Lab work.
	Topic 3.9. Muscles of the thoracic limb. The muscles of the shoulder joint, elbow joint, wrist joint, finger joints and short finger muscles.	Lectures, Lab work.
	Topic 3.10. Pelvic limb muscles. - The muscles of the hip joint, knee joint and the metatarsal joint.	Lectures, Lab work.
	Topic 3.11. Muscles of the finger joints.	Lectures, Lab work.
Module 4. General (skin) cover.	Topic 4.1. General morphofunctional characteristics of the skin and its derivatives.	Lectures, Lab work.
Module 5. Nervous system (neurology).	Topic 5.1. Morphofunctional characteristics, anatomical composition and structural elements, the principle of the nervous system.	Lectures, Lab work.
	Topic 5.2. The central part of the nervous system. - Structure and development of the central nervous system. The structure of the spinal cord and brain, functional characteristics. Conductor apparatus	Lectures, Lab work.
	Topic 5.3. Peripheral part of the nervous system. Morphofunctional characteristics of cranial and spinal nerves. General and species-specific signs of structure,	Lectures, Lab work.

	branching and location.	
	<p>Topic 5.4. The autonomic part of the nervous system.</p> <ul style="list-style-type: none"> - Anatomical, functional and topographic characteristics. <p>Regularities of the structure, formation and distribution of sympathetic, para- and metasympathetic nervous structures.</p>	Lectures, Lab work.
Module 6. Analyzers.	<p>Topic 6.1. Classification, anatomical structure and morphofunctional characteristics of analyzers. The study of the phylogeny and ontogenesis of analyzers. General data on intero-, proprio- and exteroceptors.</p>	Lectures, Lab work.
Module 7. The endocrine system.	<p>Topic 7.1. Morphofunctional characteristics and anatomical composition of the endocrine apparatus. Morphogenetic, topographic and functional characteristics of the glands of internal and mixed secretion. Specific and age-related features of the structure and location of the glands.</p>	Lectures, Lab work.
Module 8. Cardiovascular system.	<p>Topic 8.1. Anatomical composition, morphogenesis and structural and functional characteristics of the cardiovascular system and its relationship with other body systems.</p>	Lectures, Lab work.
	<p>Topic 8.2. Circulatory system.</p> <ul style="list-style-type: none"> - Structure, development, species and age characteristics. Specific features, basic patterns of the structure, branching and location of blood vessels. Circulatory circles. 	Lectures, Lab work.
	<p>Topic 8.3. Lymphatic system.</p> <ul style="list-style-type: none"> - General morphofunctional characteristics and anatomical composition of the system. Its development. General patterns and specific features of the location of the lymphatic system. 	Lectures, Lab work.

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

	features, functional purpose.	
	<p>Topic 9.3. Breathing apparatus.</p> <p>- General structure, morphogenesis of respiratory organs in connection with other body systems and the external environment. Anatomical features of the respiratory organs in the X-ray image.</p>	Lectures, Lab work.
	<p>Topic 9.4. The urinary apparatus.</p> <p>- Morphogenetic relationship and functional difference of organs of urination and reproduction. Morphofunctional characteristics of the device. X-ray-anatomy of the genitourinary apparatus.</p>	Lectures, Lab work.
	<p>Topic 9.4.1. Urinary organs.</p> <p>- Anatomical composition of the urinary system, the structure of the kidneys and urinary tract, their connection with other body systems. Species, age and topographical features of urinary organs.</p>	Lectures, Lab work.
	<p>Topic 9.4.2. Organs of reproduction.</p> <p>- Anatomical composition and structure of reproductive organs. Species, age and topographical features of the genitals and the causes of their appearance.</p>	Lectures, Lab work.
Module 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.	Lectures, Lab work.

6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

Table 6.1. Classroom equipment and technology support requirements

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
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Lecture	An auditorium for conducting lecture-type classes, equipped with a set of specialized furniture; a board (screen) and technical means of multimedia presentations.	<ul style="list-style-type: none"> - <i>Anatomical preparations.</i> - <i>Wet anatomical preparations.</i> - <i>Anatomical models.</i>
Laboratory	An auditorium for laboratory work, individual consultations, routine monitoring and interim certification, equipped with a set of specialized furniture and equipment.	<ul style="list-style-type: none"> - <i>Anatomical preparations.</i> - <i>Wet anatomical preparations.</i> - <i>Anatomical models.</i>
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. RESOURCES RECOMMENDED FOR COURSE STUDIES

Main readings:

1. Akaevsky A.I., Yudichev Yu.Yu., Seleznev S.B. ANATOMY OF DOMESTIC ANIMALS - 6th ed. - Moscow: Aquarium-Print, 2020. - 638 p.
2. Maksimov V.I., Slesarenko N.A., Seleznev S.B., Vetoshkina G.A. ANATOMY AND PHYSIOLOGY OF DOMESTIC ANIMALS. - 2nd ed. - Moscow: Gryph UMO SPO, 2020. – 600 p.

Additional Readings:

1. Zelenevsky N.V. International veterinary anatomical nomenclature in Latin and Russian. Nomina Anatomica Veterinaria: textbook – St. Petersburg: Lan, 2013 – 400p. – http://e.lanbook.com/books/element.php?pl1_id=5706
2. Popesco P. Atlas of the anatomy of domestic animals. - In 3 t. M.: design of YOYO Media, digitization , 2013. - Vol.1. -210 p. t.2. -183. T.3. – 196.
3. Slesarenko N.A., Seleznev S.B., Vetoshkina G.A. Introduction to animal pathology: integrating systems. Practical guide.-Moscow:LLC "ArtServisLtd", 2019.-268 p.
4. Seleznev S.B., Vetoshkina G.A., Krotova E.A. Anatomy of domestic animals: osteoarthrosyndesmology.-Moscow:OOO ArtServisLtd, 2017.-66 p.
5. Seleznev S.B., Vetoshkina G.A., Krotova E.A. Myology of domestic animals.- Moscow:PFUR, 2020.-28 p.

Internet sources

1. Electronic libraries (EL) of RUDN University and other institutions, to which university students have access on the basis of concluded agreements:

- RUDN Electronic Library System (RUDN ELS) <http://lib.rudn.ru/MegaPro/Web>
- EL "University Library Online" <http://www.biblioclub.ru>
- EL "Yurayt" <http://www.biblio-online.ru>
- EL "Student Consultant" www.studentlibrary.ru
- EL "Lan" <http://e.lanbook.com/>
- EL "Trinity Bridge"

2. Databases and search engines:

- electronic foundation of legal and normative-technical documentation <http://docs.cntd.ru/>
- Yandex search engine <https://www.yandex.ru/>
- Google search engine <https://www.google.ru/>
- Scopus abstract database <http://www.elsevierscience.ru/products/scopus/>

*Training toolkit for self- studies to master the course *:*

1. The set of lectures on the course "Agroecology".
2. Laboratory workshop on the course "Agroecology".

* The training toolkit for self- studies to master the course is placed on the course page in the university telecommunication training and information system under the set procedure.

8. ASSESSMENT TOOLKIT AND GRADING SYSTEM* FOR EVALUATION OF STUDENTS' COMPETENCES LEVEL UPON COURSE COMPLETION

The assessment toolkit and the grading system* to evaluate the competences formation level (competences in part) upon the course study completion are specified in the Appendix to the course syllabus.

* The assessment toolkit and the grading system are formed on the basis of the requirements of the relevant local normative act of RUDN University (regulations / order).

DEVELOPERS:

Professor
Position, Basic curriculum

Vasenev I.I.
Full name.

Signature

HEAD OF EDUCATIONAL DEPARTMENT:

Department of Veterinary Medicine
Name Basic Curriculum

Vatnikov Yu.A.
Full name.

Signature

HEAD OF HIGHER EDUCATION PROGRAMME:

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