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

Bee Diseases and Entomophages

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:

Veterinary

higher education programme profile/specialisation title

2025

1. COURSE GOAL

The goal of the course "**Bee Diseases and Entomophages**" is to prepare graduates for professional veterinary activities in the field of beekeeping, to carry out work in veterinary laboratories, beekeeping farms and specialized research institutes.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the course "**Bee Diseases and Entomophages**" 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**	**Indicators of competence accomplishment** (within the discipline)
PC-1	Ability to collect the life and health history of an animal for further diagnosis and planning of treatment and preventive measures.	PC-1.1 Collects the life history of the animal, including information about scheduled vaccinations, deworming, and other preventive treatments.
		PC-1.2 Collects information about past diseases, surgical interventions, current chronic diseases, and ongoing therapy of these conditions.
		PC-1.3 Collects information about changes in the animal's condition during the disease, conducted diagnostic and therapeutic measures, used medications, and physiotherapy methods.
PC-2	Ability to perform a full primary clinical examination of an animal to establish a preliminary clinical diagnosis (diagnoses) and conduct follow-up examinations to monitor the patient's condition.	PC-2.1 Follows proper technique and procedure for clinical examination, taking into account the species and condition of the animal.
		PC-2.2 Identifies signs (symptoms) of deviation from normal function, recognizes standard combinations of symptoms (syndromes).
		PC-2.3 Records examination results in the patient's medical chart or other medical documents.
PC-10	Ability to analyze and adjust animal feeding to enhance the effectiveness of the therapeutic process and prescribe therapeutic diets.	PC-10.1 Able to analyze the patient's diet to identify factors predisposing to disease development.
		PC-10.2 Able to justify the appointment of special feeding for therapeutic purposes in various diseases.

		PC-10.3 Able to recommend the approximate composition of therapeutic diets, the desired ratio of nutrients, and the inclusion of special additives and components enhancing the therapeutic effect of the diet.
		PC-10.4 Able to use special programs and databases to select commercial therapeutic diets and dietary supplements, as well as to create individualized therapeutic diets for animals of different species.

3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The course "**Bee Diseases and Entomophages**" refers to the elective component of the 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*
PC-1	Ability to collect the life and health history of an animal for further diagnosis and planning of treatment and preventive measures.	Base component / Базовая компонента Clinical Diagnostics / Клиническая диагностика Fish Pathology and Aquaculture / Патология рыб и аквакультура Equine Diseases / Болезни лошадей Diseases of Farm Animals / Болезни продуктивных животных Small Animal Diseases / Болезни мелких домашних животных	Exotic Animal Diseases / Болезни экзотических животных Base component / Базовая компонента Educational Practice / Учебная практика Variable component / Вариативная компонента Clinical Industrial Practice / Клиническая производственная практика Clinical Internship Industrial Research

			Practice / Производственно-исследовательская практика Preparation for Passing and Passing the State Exam / Подготовка к сдаче и сдача государственного экзамена Preparing and Passing the State Exam / Подготовка и сдача государственного экзамена Design, Preparation for Defense Procedure and Defense of the Graduation Thesis / Оформление, подготовка к процедуре защиты и защита выпускной квалификационной работы
PC-2	Ability to perform a full primary clinical examination of an animal to establish a preliminary clinical diagnosis (diagnoses) and conduct follow-up examinations to monitor the patient's condition.	Fish Pathology and Aquaculture / Патология рыб и аквакультура Equine Diseases / Болезни лошадей Diseases of Farm Animals / Болезни продуктивных животных Small Animal Diseases / Болезни мелких домашних животных	Exotic Animal Diseases / Болезни экзотических животных Base component / Базовая компонента Educational Practice / Учебная практика Variable component / Вариативная компонента Clinical Industrial Practice / Клиническая производственная практика Clinical Internship

			Industrial Research Practice / Производственно-исследовательская практика Preparation for Passing and Passing the State Exam / Подготовка к сдаче и сдача государственного экзамена Preparing and Passing the State Exam / Подготовка и сдача государственного экзамена Design, Preparation for Defense Procedure and Defense of the Graduation Thesis / Оформление, подготовка к процедуре защиты и защита выпускной квалификационной работы
PC-10	Ability to analyze and adjust animal feeding to enhance the effectiveness of the therapeutic process and prescribe therapeutic diets.	Base component / Базовая компонента Animal Nutrition and Feeding with Basics of Feed Production / Кормление животных с основами кормопроизводства Medicinal and Poisonous Plants / Лекарственные и ядовитые растения Fodder Plants / Кормовые растения Fish Pathology and Aquaculture / Патология рыб и	Exotic Animal Diseases / Болезни экзотических животных Variable component / Вариативная компонента Clinical Industrial Practice / Клиническая производственная практика Clinical Internship Industrial Research Practice / Производственно-исследовательская

		аквакультура Equine Diseases / Болезни лошадей Diseases of Farm Animals / Болезни продуктивных животных Small Animal Diseases / Болезни мелких домашних животных	практика Preparation for Passing and Passing the State Exam / Подготовка к сдаче и сдача государственного экзамена Preparing and Passing the State Exam / Подготовка и сдача государственного экзамена Design, Preparation for Defense Procedure and Defense of the Graduation Thesis / Оформление, подготовка к процедуре защиты и защита выпускной квалификационной работы

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the "**Bee Diseases and Entomophages**" is 3 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**			
			9	-	-	-
Contact academic hours		51	51	-	-	-
including						
Lectures		17	17	-	-	-
Lab work		34	34	-	-	-
Seminars (workshops/tutorials)		-	-	-	-	-
Self-study		46	46	-	-	-
Evaluation and assessment (exam/pass/fail grading)		11	11	-	-	-
Course workload	academic hours_	**108**	**108**	-	-	-
	credits	**3**	**3**	-	-	-

5. COURSE CONTENTS

Table 5.1. Course contents and academic activities types

Course module title	Course module contents (topics)	Academic activities types
Module 1. General regulatory documents on bee diseases	Topic 1.1 General regulatory documents on bee diseases.	Lectures, Lab work.
	Topic 1.2 Significance for the State.	Lectures, Lab work.
Module 2. Bee products	Topic 2.1 Propolis.	Lectures, Lab work.
	Topic 2.2 Wax.	Lectures, Lab work.
	Topic 2.3 Bee royal jelly.	Lectures, Lab work.
	Topic 2.4 Bee venom.	Lectures, Lab work.
	Topic 2.5 Drone homogenate.	Lectures, Lab work.
Module 3. Biology of the bee family	Topic 3.1 Bee breeds.	Lectures, Lab work.
	Topic 3.2 The bee family.	Lectures, Lab work.
	Topic 3.3 Development of the worker bee, queen bee and drone.	Lectures, Lab work.
Module 4. Bee Virosis	Topic 4.1 Baggy brood;	Lectures, Lab work.
	Topic 4.2 Chronic viral paralysis	Lectures, Lab work.
	Topic 4.3 Acute paralysis of bees; filamentovirosis	Lectures, Lab work.
	Topic 4.4 Iridescensvirosis	Lectures, Lab work.
	Topic 4.5 Disease "black queen bee"	Lectures, Lab work.
	Topic 4.6 Disease "darkened (cloudy) wing"	Lectures, Lab work.
	Topic 4.7 Other viros.	Lectures, Lab work.
Module 5. Bacterioses and mycoses of bees	Topic 5.1 American Rotten	Lectures, Lab work.
	Topic 5.2 European rotten	Lectures, Lab work.
	Topic 5.3 Paragnilets	Lectures, Lab

		work.
	Topic 5.4 Powdery brood	Lectures, Lab work.
	Topic 5.5 Bee septimation	Lectures, Lab work.
	Topic 5.6 Gafniosis	Lectures, Lab work.
	Topic 5.7 Other bacterioses.	Lectures, Lab work.
Module 6. Invasive bee diseases	Topic 6.1 Varroosis, other diseases	Lectures, Lab work.
Module 7. Non-infectious diseases of bees	Topic 7.1 Carbohydrate starvation.	Lectures, Lab work.
	Topic 7.2 Protein starvation.	Lectures, Lab work.
	Topic 7.3 Case toxicosis.	Lectures, Lab work.
	Topic 7.4 Chemical toxicosis.	Lectures, Lab work.
	Topic 7.5 Genetic lethality.	Lectures, Lab work.
	Topic 7.6 Frozen brood.	Lectures, Lab work.
Module 8. Veterinary and sanitary measures at the apiary	Topic 8.1 Basic preventive measures.	Lectures, Lab work.
Module 9. Regulatory documents on bee diseases	Topic 9.1 Regulatory documents on bee diseases.	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)
Lecture	An auditorium for conducting lecture-type classes, equipped with a set of specialized furniture; a board (screen) and technical means of multimedia presentations.	-
Laboratory	An auditorium for laboratory work, individual consultations, routine	-

	monitoring and interim certification, equipped with a set of specialized furniture and equipment.	
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. Beekeeping : Textbook / N. I. Krivtsov [et al.]. - St. Petersburg : Lan, 2021. - 388 p. : https://e.lanbook.com/book/153913
2. Maslennikova V.I. : Diseases and pests of bees : textbook / V.I. Maslennikova. – Moscow : Rosentomofauna, 2020. – 302 p.

Additional Readings:

1. Kaplich, V. M. Beekeeping: Textbook / V. M. Kaplich, I. S. Seryakov, N. P. Kovbasa – M. : New Knowledge, 2014 – 392 p. https://e.lanbook.com/book/64917
2. Kozin, R. B. Biology of the honey bee: A textbook / R. B. Kozin, N. V. Irenkova. - St. Petersburg : Lan, 2007. - 320 p. http://lib.rudn.ru/ProtectedView/Book/ViewBook/5672
3. Kozin, R. B. Practicum on beekeeping: A textbook / R. B. Kozin, N. V. Irenkova, V. I. Lebedev. - 2nd ed. . - St. Petersburg : Lan, 2005. - 224 p. http://lib.rudn.ru/ProtectedView/Book/ViewBook/5673
4. Kozin, R. B. Beekeeping : Textbook / R. B. Kozin, N. I. Krivtsov, V. I. Lebedev, V. M. Maslennikova - 1st ed. – St. Petersburg : Lan, 2010. – 448 p. https://e.lanbook.com/book/577
5. Osintseva, L. A. Technology, quality indicators, safety and commodity evaluation of honey : Textbook / L. A. Osintseva – Novosibirsk : Novosibirsk State Agrarian University, 2012 – 132 p. https://e.lanbook.com/book/4571?category=43798

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 "**Bee Diseases and Entomophages**".
2. Laboratory workshop on the course "**Bee Diseases and Entomophages**".

* 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).

DEVELOPER:

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Department of Veterinary Medicine		Vatnikov Yu.A.
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