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**Federal State Autonomous Educational Institution of Higher Education
Peoples' Friendship University of Russia named after Patrice Lumumba
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

1. COURSE GOAL(s)

The goal of the course "**Bee Diseases and Entomophages**" is to deepen students' knowledge in 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 (module) "**Bee Diseases and Entomophages**" is aimed at the development of the following competences /competences in part:

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

Competence code	Competence descriptor	Competence formation indicators (within this course)
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

Competence code	Competence descriptor	Competence formation indicators (within this course)
		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 (B1) block of the higher educational programme curriculum.

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*	Subsequent courses/modules*
PC-1	Ability to collect the life and health history of an animal for further diagnosis and planning of treatment and preventive measures.	Clinical Diagnostics Fish Pathology and Aquaculture Equine Diseases Diseases of Farm Animals Small Animal Diseases	Exotic Animal Diseases Educational Practice Clinical Industrial Practice Clinical Internship Industrial Research Practice
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 Equine Diseases Diseases of Farm Animals Small Animal Diseases	Exotic Animal Diseases Educational Practice Clinical Industrial Practice Clinical Internship Industrial Research Practice
PC-10	Ability to analyze and adjust animal feeding to enhance the effectiveness of the therapeutic process and prescribe therapeutic diets.	Animal Nutrition and Feeding with Basics of Feed Production Medicinal and Poisonous Plants Fodder Plants Fish Pathology and Aquaculture	Exotic Animal Diseases Clinical Industrial Practice Clinical Internship Industrial Research Practice

Competence code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
		Equine Diseases Diseases of Farm Animals Small Animal Diseases	

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the course "**Bee Diseases and Entomophages**" is 3 credits (108 academic hours).

*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	-	-	-
<i>Contact academic hours</i>	<i>51</i>	<i>51</i>	-	-	-
including:					
Lectures (LC)	17	17	-	-	-
Lab work (LW)	34	34	-	-	-
Seminars (workshops/tutorials) (S)	-	-	-	-	-
<i>Self-studies</i>	<i>46</i>	<i>46</i>	-	-	-
<i>Evaluation and assessment (exam/passing/failing grade)</i>	<i>11</i>	<i>11</i>	-	-	-
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.	LC, LW
	Topic 1.2 Significance for the State.	LC, LW
Module 2. Bee products	Topic 2.1 Propolis.	LC, LW
	Topic 2.2 Wax.	LC, LW
	Topic 2.3 Bee royal jelly.	LC, LW
	Topic 2.4 Bee venom.	LC, LW
	Topic 2.5 Drone homogenate.	LC, LW
Module 3. Biology of the bee family	Topic 3.1 Bee breeds.	LC, LW
	Topic 3.2 The bee family.	LC, LW
	Topic 3.3 Development of the worker bee, queen bee and drone.	LC, LW

Course module title	Course module contents (topics)	Academic activities types
Module 4. Bee Virosis	Topic 4.1 Baggy brood;	LC, LW
	Topic 4.2 Chronic viral paralysis	LC, LW
	Topic 4.3 Acute paralysis of bees; filamentovirosis	LC, LW
	Topic 4.4 Iridescensvirosis	LC, LW
	Topic 4.5 Disease "black queen bee"	LC, LW
	Topic 4.6 Disease "darkened (cloudy) wing"	LC, LW
	Topic 4.7 Other viros.	LC, LW
Module 5. Bacterioses and mycoses of bees	Topic 5.1 American Rotten	LC, LW
	Topic 5.2 European rotten	LC, LW
	Topic 5.3 Paragnilets	LC, LW
	Topic 5.4 Powdery brood	LC, LW
	Topic 5.5 Bee septimation	LC, LW
	Topic 5.6 Gafniosis	LC, LW
	Topic 5.7 Other bacterioses.	LC, LW
Module 6. Invasive bee diseases	Topic 6.1 Varroosis, other diseases	LC, LW
Module 7. Non-infectious diseases of bees	Topic 7.1 Carbohydrate starvation.	LC, LW
	Topic 7.2 Protein starvation.	LC, LW
	Topic 7.3 Case toxicosis.	LC, LW
	Topic 7.4 Chemical toxicosis.	LC, LW
	Topic 7.5 Genetic lethality.	LC, LW
	Topic 7.6 Frozen brood.	LC, LW
Module 8. Veterinary and sanitary measures at the apiary	Topic 8.1 Basic preventive measures.	LC, LW
Module 9. Regulatory documents on bee diseases	Topic 9.1 Regulatory documents on bee diseases.	LC, LW

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	A lecture hall for lecture-type classes, equipped with a set of specialised furniture; board (screen) and technical means of multimedia presentations.	-
Lab work	A classroom for laboratory work, individual consultations, current and mid-term assessment; equipped with a set of specialised	-

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
	furniture and machinery.	
Self-studies	A classroom for independent work of students (can be used for seminars and consultations), equipped with a set of specialised furniture and computers with access to the electronic information and educational environment.	-

7. RESOURCES RECOMMENDED FOR COURSE STUDY

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/](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. The laboratory workshop (if any).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.

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