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**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

Diseases of bees 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

The goal of the course "**Diseases of bees 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 "**Diseases of bees 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 gather a history of the animal's life and health for further diagnosis and planning of treatment and preventive measures.	PC-1.1 Gathers the animal's life history, information on routine vaccinations, deworming and other preventive treatments.
		PC-1.2 Collects information on past illnesses, surgical interventions, current chronic illnesses, and ongoing therapy for these illnesses.
		PC-1.3 Collects information on changes in the animal's condition during the course of the disease, diagnostic and therapeutic measures taken, medications used and methods of physical therapy.
PC-2	Ability to perform a complete initial clinical examination of the animal to make a preliminary clinical diagnosis(s) and repeat examinations to monitor the patient's condition.	PC-2.1 Observes the technique and procedure of clinical examination, taking into account the type of animal and its condition.
		PC-2.2 Identifies signs (symptoms) of deviations from normal function, recognizes standard combinations of signs (syndromes).
		PC-2.3 Records the results of the examination in the patient's chart/other medical documents
PC-10	Ability to analyze and adjust animal feeding to improve the effectiveness of the therapeutic process, prescribe therapeutic diets.	PC-10.1 Able to analyze a patient's diet to identify factors predisposing to the development of disease.
		PC-10.2 Able to justify the prescription of special food to an animal for therapeutic purposes for various diseases

		PC-10.3 Can recommend approximate composition of therapeutic diets, desirable ratio of nutrients, availability of special additives and components that enhance the therapeutic effect of the diet
		PC-10.4 Able to use special programs and databases to select industrial therapeutic diets and dietary supplements, as well as to compose individual therapeutic diets for animals of different species.

3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The course "**Diseases of bees 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 gather a history of the animal's life and health for further diagnosis and planning of treatment and preventive measures.	Clinical diagnostics Horse diseases Diseases of productive animals Diseases of small pets	Fish pathology and aquaculture Diseases of exotic animals Study practice Clinical internship Industrial practice Academic research practice with the preparation of a scientific qualification project Preparation for and passing the state exam
PC-2	Ability to perform a complete initial clinical examination of the animal to make a preliminary clinical diagnosis(s) and repeat examinations to monitor the patient's condition.	Clinical diagnostics Horse diseases Diseases of productive animals Diseases of small pets	Fish pathology and aquaculture Diseases of exotic animals Study practice Clinical internship Industrial practice Academic research

			practice with the preparation of a scientific qualification project Preparation for and passing the state exam
PC-10	Ability to analyze and adjust animal feeding to improve the effectiveness of the therapeutic process, prescribe therapeutic diets.	Feeding animals with the basics of forage production Medicinal and poisonous plants Fodder plants Horse diseases Diseases of productive animals Diseases of small pets	Fish pathology and aquaculture Diseases of exotic animals Clinical internship Industrial practice Academic research practice with the preparation of a scientific qualification project Preparation for and passing the state exam

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the "**Diseases of bees 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	41	41	-	-	-
Evaluation and assessment (exam/pass/fail grading)	16	16	-	-	-
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.	-
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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.elsevier.com/locate/scopus/>

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

1. The set of lectures on the course "**Diseases of bees and entomophages**".
2. Laboratory workshop on the course "**Diseases of bees 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:

Associate Professor of the Department of Veterinary
Medicine

Position, Basic curriculum

Signature

Drukovsky S.G.

Full name.

HEAD OF EDUCATIONAL DEPARTMENT:

Department of Veterinary Medicine

Name Basic Curriculum

Signature

Vatnikov Yu.A.

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HEAD OF HIGHER EDUCATION PROGRAMME:

Director of the Department of Veterinary Medicine

Position, Basic curriculum

Signature

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