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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

Fish pathology and aquaculture

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:

36.05.01 Veterinary

higher education programme profile/specialisation title

1. GOALS AND OBJECTIVES OF THE COURSE

The aim of mastering the course "**Fish pathology and aquaculture**" is to prepare graduates for professional veterinary activities in the field of fish farming, to carry out work in veterinary laboratories, fish farms and specialized research institutes.

2. REQUIREMENTS FOR LEARNING OUTCOMES

The implementation of the course "**Fish pathology and aquaculture**" 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 course (results of the development of the discipline)

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	PC-10.1 Able to analyze a patient's diet to identify factors predisposing to the development of disease.

	therapeutic diets.	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 "**Fish pathology and aquaculture**" belongs to the part formed by the participants of educational relations of the 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 course "**Fish pathology and aquaculture**".

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

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 Diseases of bees and entomophages	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	Clinical diagnostics Horse diseases Diseases of productive animals Diseases of small pets	Diseases of exotic animals Study practice Clinical internship Industrial practice

	diagnosis(s) and repeat examinations to monitor the patient's condition.	Diseases of bees and entomophages	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 Diseases of bees and entomophages	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 TRAINING ACTIVITIES

Course workload of the course "**Fish pathology and aquaculture**" is 3 credits.

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

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 Content of the course (module) by type of academic work

Modules	Content of the modules (topics)	Types of academic activities
Module 1. General regulatory documents on fish diseases	Topic 1.1 General regulatory documents on fish diseases.	Lectures, Lab work.
	Topic 1.2 Significance for the State.	Lectures, Lab work.
Module 2. Viral diseases of fish	Topic 2.1 Fish vibriosis.	Lectures, Lab work.
	Topic 2.2 Spring viremia of carp (VVC).	Lectures, Lab work.
Module 3. Bacterial diseases of fish	Topic 3.1 Infectious necrosis of hematopoietic tissue of salmon.	Lectures, Lab work.
	Topic 3.2 Infectious necrosis of the salmon pancreas (VHS).	Lectures, Lab work.
Module 4. Mycoses of fish	Topic 4.1 Viral hemorrhagic septicemia of salmon.	Lectures, Lab work.
	Topic 4.2 Infectious anemia of salmon.	Lectures, Lab work.
Module 5. Protozoal diseases of fish	Topic 5.1 Inflammation of the carp swim bladder (RUNWAY).	Lectures, Lab work.
	Topic 5.2 Smallpox (papillomatosis, epithelioma) of carp.	Lectures, Lab work.
Module 6. Helminthiasis of fish. Monogenoidosis. Cestodoses	Topic 6.1 Aeromonosis.	Lectures, Lab work.
	Topic 6.2 Bacterial renal disease of salmon.	Lectures, Lab work.
Module 7. Helminthiasis of fish. Trematodoses. Nematodes	Topic 7.1 Yersiniosis.	Lectures, Lab work.
	Topic 7.2 Myxobacterioses.	Lectures, Lab work.
Module 8. Crustaceoses and other parasitoses	Topic 8.1 Pseudomonosis.	Lectures, Lab work.
Module 9. Non-communicable diseases of fish	Topic 9.1 Saprolegniosis.	Lectures, Lab work.
	Topic 9.2 Furunculosis.	Lectures, Lab work.
	Topic 9.3 Erythrodermatitis.	Lectures, Lab work.
Module 10. Veterinary-sanitary and preventive measures at fish farms.	Topic 10.1 Branchiomycosis. Deep mycosis.	Lectures, Lab work.

6. COURSE EQUIPMENT 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 course (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:

- Schislenko, S. A. Infectious diseases of fish: a textbook for universities / S. A. Schislenko. — Moscow : Yurayt Publishing House, 2021. - 225 p. — (Higher education). — ISBN 978-5-534-13787-3. — Text: electronic // EBS Yurayt [website]. — URL: <https://urait.ru/bcode/466888>
- Fish farming : textbook / V.I. Komlatsky, G.V. Komlatsky, V.A. Velichko. - 2nd ed., ispr. - St. Petersburg : Publishing House "Lan", 2018. - 200 p. : <https://lib.rudn.ru/MegaPro/Web/SearchResult/ToPage/464877>

Additional Readings:

- Ichthyopathology : textbook / A.M. Ataev, M.M. Zubairova. - Electronic text data. - St. Petersburg : Lan, 2015. - 352 p. : <https://lib.rudn.ru/MegaPro/Download/MObject/5650>
- Diagnostics of diseases and veterinary examination of fish: an educational and methodical manual / K.S. Malovastyy. - St. Petersburg : Publishing House "Lan", 2013. - 512 p. : <https://lib.rudn.ru/MegaPro/Web/SearchResult/ToPage/465226>

3. Ichthyology. Basic course : textbook / V.P. Ivanov, V.I. Egorova, T.S. Ershova. - 3rd ed., reprint. - St. Petersburg : Publishing House "Lan", 2017. - 360 p. : <https://lib.rudn.ru/MegaPro/Web/SearchResult/ToPage/464992>
4. Physiology of fish : an educational and methodological guide. Book 2 : Nutrition and digestion / V.G. Skopichev, L.Y. Karpenko, I.O. Bogolyubova [and others] ; under the total. edited by V.G. Skopichev. - Electronic text data. - St. Petersburg : Quadro, 2017. - 344 p.
5. Physiology of fish : a textbook. Book 1 : Physiology of blood and blood circulation of fish. Immune system of fish / L.V. Zhichkina, L.Y. Karpenko, M.K. Kasumov, V.G. Skopichev. - Electronic text data. - St. Petersburg : Quadro, 2017. - 200 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/](https://www.yandex.ru/)
- Google search engine <https://www.google.ru/>
- Scopus abstract database <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 course "**Fish pathology and aquaculture**".
2. Laboratory workshop on the course "**Fish pathology and aquaculture**".

* - The training toolkit and guidelines for the internship are placed on the internship 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 AS COURSE RESULTS

The assessment toolkit and the grading system* to evaluate the level of competences (competences in part) formation as the course results 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.

Full name.

HEAD OF

HIGHER EDUCATION PROGRAMME:

Director of the Department of Veterinary Medicine

Position, Basic curriculum

Signature

Vatnikov Yu.A.

Full name