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**Federal State Autonomous Educational Institution for Higher Education PEOPLES'
FRIENDSHIP UNIVERSITY OF RUSSIA
Agrarian and Technological Institute**

WORKING COURSE SYLLABUS

Fish pathology and aquaculture

Recommended by the Methodological Council for the Education Field:

36.05.01 Veterinary medicine

1. GOALS AND OBJECTIVES OF THE DISCIPLINE

The aim of mastering the discipline "**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 THE RESULTS OF MASTERING THE DISCIPLINE

The development of the discipline "**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 discipline (results of the development of the discipline)

Code	Competence	Indicators of competence accomplishment (within the discipline)
GPC -1	The ability to determine the biological status and normative clinical indicators of organs and systems of the animal body.	GPC-1.1 Knows the structure and functions of the main systems of the animal body, taking into account the specific features
		GPC-1.2 He s able to predict the expected violations of the biological status in case of suspected development of diseases
		GPC-1.3 He is able to determine the main indicators of the activity of individual body systems and draw conclusions about the presence of deviations from the standard values
		GPC-1.4 Has the skills of sampling biological fluids and tissues for research, performing laboratory tests, interpreting research results.
GPC-2	The ability to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological state of the animal organism.	GPC-2.1 Has knowledge of the influence of natural, socio-economic, genetic and economic factors on the animal body.
		GPC-2.2 He is able to establish the presence and reliability of cause-and-effect relationships between the effects of certain etiological factors on the animal's body and the development of diseases.
		GPC-2.3 Possesses methods of preventive and curative correction of the effects of adverse environmental factors that can cause deterioration of animal health.
GPC -4	The ability to use methods of solving problems using modern equipment in the development	GPC-4.1 Possesses the conceptual and methodological apparatus of basic natural sciences at a level sufficient for full-

	of new technologies in professional activity and to use modern professional methodology for conducting experimental research and interpreting their results.	fledged professional activity at the modern level.
		GPC-4.2 He knows the methods of solving problems using modern equipment.
		GPC-4.3 He is ready to use modern methodology in the development and conduct of experimental research.
		GPC-4.4 Uses modern professional methodology in interpreting research results.
GPC -6	The ability to analyze, identify and assess the risk of the risk of the occurrence and spread of diseases.	GPC-6.1 Has knowledge in the field of etiology and pathogenesis of animal diseases of different species.
		GPC-6.2 Has the skills to diagnose non-infectious, infectious and invasive diseases, identify pathogens of infectious and invasive diseases in animals.
		GPC-6.3 He knows the patterns of the occurrence and spread of diseases in animal populations, factors predisposing to diseases and the causes of possible complications.
PC -2	The ability to conduct a general clinical study of animals in order to establish a preliminary diagnosis and determine the further research program, as well as in accordance with the plan of antiepidemiological measures, the plan of prevention of non-infectious animal diseases.	PC-2.1 He is able to conduct a general clinical study of animals of different species in order to establish a preliminary diagnosis and determine the further research program
		PC-2.2 He is able to conduct mass clinical studies of animals in accordance with the plan of antiepidemiological measures, the plan of prevention of non-infectious animal diseases
PC -3	Ability to develop animal research programs using special (instrumental) and laboratory methods.	PC-3.1 He is able to develop individual animal research programs, including the use of special (instrumental) and laboratory methods to detect deviations from the physiological norm of the state of a living organism, conduct differential diagnosis of the detected pathology or control the course of the disease and the

		effectiveness of the prescribed treatment.
		PC-3.2 Capable of developing mass comprehensive animal research programs (medical examination programs) of animals, taking into account their type and purpose, both general and special.
PC -5	The ability to make a diagnosis based on the analysis of anamnesis data, general, special (instrumental) and laboratory research methods.	PC-5.1 He is able to diagnose patients of various types based on the analysis of anamnesis data, general, special (instrumental) and laboratory research methods.
		PC -5.2 He is able to predict the risks of diseases based on anamnestic data, the results of general, special (instrumental) and laboratory studies.
PC -6	The ability to develop a treatment plan for animals based on the established diagnosis and individual characteristics of animals.	PC-6.1 Able to develop a treatment plan for animals based on the established diagnosis and individual characteristics of animals.
		PC-6.2 He is able to develop recommendations on therapeutic and preventive manipulations to prevent diseases, the high probability of which was revealed during the study of the patient.
		PC-6.3 He is able to develop recommendations for carrying out preventive and curative measures based on the results of the examination of animals carried out as part of the medical examination.
PC -7	The ability to choose the necessary drugs of chemical and biological nature for the treatment of animals, taking into account their combined pharmacological effect on the body.	PC -7.1 He is able to choose medicines of chemical and biological nature necessary for the treatment of animals, guided by the principles of evidence-based medicine, taking into account their combined pharmacological effect on the body.
		PC-7.2 He is able to justify the prescription of a drug in a certain clinical case or the impossibility of using this drug in the situation under consideration.
		PC-7.3 He is able to calculate the dose, frequency and duration of the course of application of the drug to the patient, taking into account the form of release

		and the characteristics of the administration of the drug to the patient.
		PC-7.4 He is able to take into account drug interactions when prescribing a course of treatment to an animal already receiving medications and biologically active additives due to the presence of diseases identified earlier.
		PC-7.5 He is able to take into account economic, species and age characteristics, as well as the results of laboratory studies of the patient when choosing drugs for the treatment of the patient.
PC -15	Ability to organize preventive immunizations (vaccinations), therapeutic and preventive treatments of animals in accordance with the plan of anti-epizootic measures.	PC-15.1 He is able to make individual and group plans of preventive immunizations (vaccinations) taking into account the epizootic situation in the territory of the animals' stay, the plan of anti-epizootic measures, as well as state and regional veterinary and sanitary rules and requirements.
		PC-15.2 He is able to organize therapeutic and preventive treatment of animals in accordance with the plan of anti-epizootic measures, as well as, if necessary, taking into account the real epizootic situation in the places where animals stay, including in conditions of agricultural production.
PC -16	Ability to organize organizational, technical, zootechnical and veterinary measures aimed at the prevention of non-communicable diseases in accordance with the plan for the prevention of non-communicable animal diseases	PC-16.1 He is able to assess the impact of animal housing and feeding conditions on their health as part of the implementation of action plans for the prevention of animal diseases
		PC-16.2 He is able to carry out veterinary quality control and procurement of animal feed in order to ensure their veterinary and sanitary safety as part of the implementation of action plans for the prevention of animal diseases
		PC-16.3 He is able to detect deviations from the plan of timing, types, quality of measures to prevent the occurrence of non-infectious animals
		PC-16.4 Take corrective measures to implement measures to prevent the occurrence of non-infectious animal diseases based on the results of control

		PC-16.5 Conduct conversations, lectures, seminars for employees of the organization in order to explain the principles of work on the prevention of animal diseases
PC -19	The ability to perform post-mortem diagnostic examination of animals in order to establish pathological processes, diseases, causes of death.	<p>PC-19.1 Able to conduct a general examination of animal corpses before autopsy.</p> <p>PC-19.2 He is capable of performing autopsy of animal corpses using special tools and compliance with safety requirements.</p> <p>PC -19.3 He is able to establish the cause of death and a pathoanatomic diagnosis in accordance with generally accepted criteria and classifications, lists of animal diseases.</p> <p>PC-19.4 He is able to formalize the results of a postmortem diagnostic examination of an animal in the autopsy protocol.</p>
PC -20	Ability to develop an annual plan of antiepzootic measures, a plan for the prevention of non-infectious animal diseases, a plan of veterinary and sanitary measures.	<p>PC-20.1 Able to conduct epizootological examination of the organization, territory.</p> <p>PC-20.2 He is able to develop an annual plan of antiepzootic and antiparasitic measures, a plan for the prevention of non-infectious animal diseases, a plan of veterinary and sanitary measures.</p> <p>PC-20.3 He is able to analyze the effectiveness of measures for the prevention of animal diseases in order to improve them.</p>
PC -22	Ability to organize measures to protect the organization from the introduction of infectious and invasive diseases in accordance with the plan of antiepzootic measures.	<p>PC -22.1 He is able to assess the epizootic state of an organization (territory), identify risks and possible causes of epizootic foci, as well as factors affecting their spread in specific organizations, territories.</p> <p>PC-22.2 Able to choose and apply the most effective measures to protect the organization from the introduction of infectious and invasive diseases.</p> <p>PC-22.3 He is able to carry out operational control of the effectiveness of the activities carried out.</p>
PC -23	The ability to analyze the effectiveness of measures for the prevention of animal	PC-23.1 He is capable of collecting and analyzing information, including veterinary statistics data, necessary to

	diseases in order to improve them.	<p>assess the effectiveness of preventive antiepidemiologic measures, prevention of non-infectious animal diseases, veterinary and sanitary measures.</p> <p>PC-23.2 Able to evaluate the effectiveness of preventive measures and methods of their implementation, including using special software.</p> <p>PC -23.3 He is able to make suggestions on the correction of measures for the prevention of animal diseases on the basis of the analysis carried out.</p>
PC -24	Ability and willingness to promote veterinary knowledge, including in the field of prevention of animal diseases.	<p>PC-24.1 He is able to set goals in the field of veterinary knowledge promotion, plan the strategy and tactics of upcoming events.</p> <p>PC-24.2 He is able to use computer and telecommunication facilities for the preparation and demonstration of materials used in the process of promoting veterinary knowledge.</p> <p>PC-24.3 He is able to conduct conversations, lectures, seminars for employees of the organization in order to explain the principles of work on the prevention of animal diseases.</p>

3. COURSE IN HIGHER EDUCATION

The discipline "**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 discipline "**Fish pathology and aquaculture**".

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

Competence code	Competence	Previous Disciplines (Modules)	Subsequent Disciplines (Modules)
GPC -1	The ability to determine the biological status and normative clinical indicators of organs and systems of the animal body.	Animal anatomy Cytology, histology and embryology Physiology and ethology of animals Pathological physiology	Anesthesiology, intensive care and intensive care

		<p>Clinical diagnosis Pathological anatomy Instrumental diagnostic methods Obstetrics, gynecology and andrology Immunology Clinical laboratory diagnostics Laboratory diagnostics of infectious and invasive diseases Veterinary and industrial laboratories with the basics of design Bee diseases and entomophages</p>	
GPC-2	<p>The ability to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological state of the animal organism.</p>	<p>Biology with the basics of ecology Veterinary genetics Veterinary microbiology and mycology Virology and biotechnology Physiology and ethology of animals Breeding with the basics of private animal husbandry Animal health and welfare Pathological physiology Veterinary Radiobiology Pathological anatomy Instrumental diagnostic methods Toxicology Obstetrics, gynecology and andrology Internal non-infectious diseases General surgery Private Veterinary surgery Parasitology and invasive diseases Epizootology and</p>	<p>Diseases of exotic animals Anesthesiology, intensive care and intensive care Dermatology Cardiology Endocrinology Nephrology Veterinary Ophthalmology Animal Dentistry</p>

		<p>infectious diseases Forensic veterinary examination and autopsy of animals Immunology General and veterinary ecology Veterinary sanitation Forage plants Zoopsychology Animal Health Diseases of horses Diseases of productive animals Diseases of small pets Diseases of small pets Bee diseases and entomophages</p>	
GPC -4	<p>The ability to use methods of solving problems using modern equipment in the development of new technologies in professional activity and to use modern professional methodology for conducting experimental research and interpreting their results.</p>	<p>Inorganic and analytical chemistry Organic Chemistry Biological physics Computer science Physical and colloidal chemistry Cytology, histology and embryology Biological chemistry Veterinary microbiology and mycology Virology and biotechnology Physiology and ethology of animals Breeding with the basics of private animal husbandry Pathological physiology Veterinary Radiobiology Clinical diagnosis Pathological anatomy Operative surgery with topographic anatomy Instrumental diagnostic methods Toxicology Obstetrics, gynecology</p>	<p>Diseases of exotic animals Anesthesiology, intensive care and intensive care Dermatology Cardiology Endocrinology Nephrology Reconstructive and reconstructive surgery Veterinary Ophthalmology Animal Dentistry</p>

		<p>and andrology Internal non-infectious diseases General surgery Private Veterinary surgery Parasitology and invasive diseases Epizootology and infectious diseases Mathematics Immunology Veterinary sanitation Technology of processing livestock products Medicinal and poisonous plants Forage plants Fundamentals of intellectual work Personality psychology and professional self-determination Clinical laboratory diagnostics Laboratory diagnostics of infectious and invasive diseases Diseases of horses Diseases of productive animals Diseases of small pets Diseases of small pets Bee diseases and entomophages</p>	
GPC -6	The ability to analyze, identify and assess the risk of the risk of the occurrence and spread of diseases.	<p>Biology with the basics of ecology Life safety Veterinary microbiology and mycology Virology and biotechnology Animal health and welfare Feeding animals with the basics of feed production</p>	<p>Diseases of exotic animals Anesthesiology, intensive care and intensive care Veterinary Ophthalmology Animal Dentistry</p>

		<p> Veterinary Radiobiology Clinical diagnosis Pathological anatomy Instrumental diagnostic methods Toxicology Obstetrics, gynecology and andrology Internal non-infectious diseases General surgery Private Veterinary surgery Parasitology and invasive diseases Epizootology and infectious diseases Veterinary and sanitary examination Organization of veterinary business Forensic veterinary examination and autopsy of animals Introduction to the specialty General and veterinary ecology Veterinary sanitation Technology of processing livestock products Medicinal and poisonous plants Forage plants Animal Health Clinical laboratory diagnostics Laboratory diagnostics of infectious and invasive diseases Organization of state veterinary supervision Diseases of horses Diseases of productive animals Diseases of small pets </p>	
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		Diseases of small pets Bee diseases and entomophages	
PC -2	The ability to conduct a general clinical study of animals in order to establish a preliminary diagnosis and determine the further research program, as well as in accordance with the plan of antiepzootic measures, the plan of prevention of non-infectious animal diseases.	Physiology and ethology of animals Pathological physiology Clinical diagnostics Pathological anatomy Obstetrics, gynecology and andrology Bee diseases and entomophages	Anesthesiology, intensive care and intensive care
PC -3	Ability to develop animal research programs using special (instrumental) and laboratory methods.	Organic Chemistry Biological physics Physical and colloidal chemistry Biological chemistry Veterinary microbiology and mycology Virology and biotechnology Physiology and ethology of animals Pathological physiology Clinical diagnosis Pathological anatomy Instrumental diagnostic methods Toxicology Obstetrics, gynecology and andrology Internal non-infectious diseases General surgery Private Veterinary surgery Parasitology and invasive diseases Epizootology and infectious diseases Immunology Veterinary deontology Clinical laboratory diagnostics Laboratory diagnostics	Diseases of exotic animals Anesthesiology, intensive care and intensive care Dermatology Cardiology Endocrinology Nephrology Reconstructive and reconstructive surgery Veterinary Ophthalmology Animal Dentistry

		of infectious and invasive diseases Veterinary and industrial laboratories with the basics of design Diseases of horses Diseases of productive animals Diseases of small pets Diseases of small pets Bee diseases and entomophages	
PC -5	The ability to make a diagnosis based on the analysis of anamnesis data, general, special (instrumental) and laboratory research methods.	Veterinary genetics Cytology, histology and embryology Physiology and ethology of animals Breeding with the basics of private animal husbandry Feeding animals with the basics of feed production Pathological physiology Clinical diagnosis Pathological anatomy Toxicology Obstetrics, gynecology and andrology Internal non-infectious diseases General surgery Private Veterinary surgery Parasitology and invasive diseases Epizootology and infectious diseases Forensic veterinary examination and autopsy of animals Zoopsychology Diseases of horses Diseases of productive animals Diseases of small pets Diseases of small pets Bee diseases and	Diseases of exotic animals Anesthesiology, intensive care and intensive care Dermatology Cardiology Endocrinology Nephrology Reconstructive and reconstructive surgery Veterinary Ophthalmology Animal Dentistry

		entomophages	
PC -6	The ability to develop a treatment plan for animals based on the established diagnosis and individual characteristics of animals.	Veterinary genetics Veterinary microbiology and mycology Virology and biotechnology Pathological physiology Veterinary Pharmacology Toxicology Obstetrics, gynecology and andrology Internal non-infectious diseases General surgery Private Veterinary surgery Parasitology and invasive diseases Epizootology and infectious diseases Mathematics Immunology Zoopsychology Diseases of horses Diseases of productive animals Diseases of small pets Diseases of small pets Bee diseases and entomophages	Diseases of exotic animals Anesthesiology, intensive care and intensive care Dermatology Cardiology Endocrinology Nephrology Reconstructive and reconstructive surgery Veterinary Ophthalmology Animal Dentistry
PC -7	The ability to choose the necessary drugs of chemical and biological nature for the treatment of animals, taking into account their combined pharmacological effect on the body.	Inorganic and analytical chemistry Organic Chemistry Physical and colloidal chemistry Biological chemistry Veterinary microbiology and mycology Virology and biotechnology Pathological physiology Veterinary Pharmacology Toxicology Obstetrics, gynecology and andrology	Diseases of exotic animals Anesthesiology, intensive care and intensive care Dermatology Cardiology Endocrinology Nephrology Veterinary Ophthalmology Animal Dentistry

		<p>Internal non-infectious diseases</p> <p>General surgery</p> <p>Private Veterinary surgery</p> <p>Parasitology and invasive diseases</p> <p>Epizootology and infectious diseases</p> <p>Medicinal and poisonous plants</p> <p>Diseases of horses</p> <p>Diseases of productive animals</p> <p>Diseases of small pets</p> <p>Diseases of small pets</p> <p>Bee diseases and entomophages</p>	
PC -15	<p>Ability to organize preventive immunizations (vaccinations), therapeutic and preventive treatments of animals in accordance with the plan of anti-epizootic measures.</p>	<p>Virology and biotechnology</p> <p>Parasitology and invasive diseases</p> <p>Epizootology and infectious diseases</p> <p>Immunology</p> <p>Veterinary sanitation</p> <p>Bee diseases and entomophages</p>	-
PC -16	<p>Ability to organize organizational, technical, zootechnical and veterinary measures aimed at the prevention of non-communicable diseases in accordance with the plan for the prevention of non-communicable animal diseases</p>	<p>Veterinary genetics</p> <p>Life safety</p> <p>Physiology and ethology of animals</p> <p>Breeding with the basics of private animal husbandry</p> <p>Animal health and welfare</p> <p>Feeding animals with the basics of feed production</p> <p>Obstetrics, gynecology and andrology</p> <p>Internal non-infectious diseases</p> <p>General surgery</p> <p>Private Veterinary surgery</p> <p>Organization of</p>	<p>Diseases of exotic animals</p> <p>Veterinary</p> <p>Ophthalmology</p> <p>Animal Dentistry</p>

		veterinary business Fundamentals of Economics and Management Economics and organization of agricultural production Medicinal and poisonous plants Forage plants Zoopsychology Animal Health Diseases of horses Diseases of productive animals Diseases of small pets Diseases of small pets Bee diseases and entomophages	
PC -19	The ability to perform post-mortem diagnostic examination of animals in order to establish pathological processes, diseases, causes of death.	Cytology, histology and embryology Life safety Pathological anatomy Toxicology Obstetrics, gynecology and andrology Internal non-infectious diseases General surgery Private Veterinary surgery Parasitology and invasive diseases Epizootology and infectious diseases Veterinary and sanitary examination Forensic veterinary examination and autopsy of animals Clinical laboratory diagnostics Laboratory diagnostics of infectious and invasive diseases Diseases of horses Diseases of productive animals	Diseases of exotic animals Dermatology Cardiology Endocrinology Nephrology Veterinary Ophthalmology Animal Dentistry

		Diseases of small pets Bee diseases and entomophages	
PC -20	Ability to develop an annual plan of antiepizootic measures, a plan for the prevention of non-infectious animal diseases, a plan of veterinary and sanitary measures.	Veterinary microbiology and mycology Animal health and welfare Feeding animals with the basics of feed production Internal non-infectious diseases General surgery Private Veterinary surgery Parasitology and invasive diseases Epizootology and infectious diseases Organization of veterinary business Fundamentals of Economics and Management Veterinary sanitation Economics and organization of agricultural production Animal Health Bee diseases and entomophages	-
PC -22	Ability to organize measures to protect the organization from the introduction of infectious and invasive diseases in accordance with the plan of antiepizootic measures.	Life safety Veterinary microbiology and mycology Virology and biotechnology Animal health and welfare Veterinary Pharmacology Private Veterinary surgery Parasitology and invasive diseases Epizootology and infectious diseases Organization of veterinary business	-

		<p>General and veterinary ecology</p> <p>Veterinary sanitation</p> <p>Technology of processing livestock products</p> <p>Animal Health</p> <p>Laboratory diagnostics of infectious and invasive diseases</p> <p>Organization of state veterinary supervision</p> <p>Bee diseases and entomophages</p>	
PC -23	<p>The ability to analyze the effectiveness of measures for the prevention of animal diseases in order to improve them.</p>	<p>Breeding with the basics of private animal husbandry</p> <p>Animal health and welfare</p> <p>Toxicology</p> <p>Internal non-infectious diseases</p> <p>General surgery</p> <p>Private Veterinary surgery</p> <p>Parasitology and invasive diseases</p> <p>Epizootology and infectious diseases</p> <p>Veterinary and sanitary examination</p> <p>Organization of veterinary business</p> <p>Forensic veterinary examination and autopsy of animals</p> <p>Fundamentals of Economics and Management</p> <p>Veterinary sanitation</p> <p>Economics and organization of agricultural production</p> <p>Animal Health</p> <p>Organization of state veterinary supervision</p> <p>Bee diseases and entomophages</p>	-

PC -24	Ability and willingness to promote veterinary knowledge, including in the field of prevention of animal diseases.	Physiology and ethology of animals Breeding with the basics of private animal husbandry Animal health and welfare Feeding animals with the basics of feed production Pathological physiology Pathological anatomy Toxicology Obstetrics, gynecology and andrology Internal non-infectious diseases General surgery Private Veterinary surgery Parasitology and invasive diseases Epizootology and infectious diseases Fundamentals of rhetoric and communication Introduction to the specialty General and veterinary ecology Veterinary sanitation Veterinary deontology Economics and organization of agricultural production Medicinal and poisonous plants Forage plants Zoopsychology Animal Health Diseases of horses Diseases of productive animals Diseases of small pets Diseases of small pets Bee diseases and entomophages	Diseases of exotic animals Dermatology Cardiology Endocrinology Nephrology Reconstructive and reconstructive surgery Veterinary Ophthalmology Animal Dentistry Foreign language for special purposes Russian for special purposes Foreign language. Translation of special texts Russian language. Translation of special texts Foreign language. Professional communications Russian language. Professional communications
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4. COURSE WORKLOAD AND TRAINING ACTIVITIES

Course workload of the discipline "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

Types of academic activities		HOURS	Semesters				
			9	-	-	-	
Contact academic hours		54	54	-	-	-	
including							
Lectures		18	18	-	-	-	
Lab work		36	36	-	-	-	
Seminars (workshops/tutorials)		-	-	-	-	-	
Self-study		38	38	-	-	-	
Evaluation and assessment (exam/pass/fail grading)		16	16	-	-	-	
Course workload		Academic hour	108	108	-	-	-
		Credit unit	3	3	-	-	-

Table 4.2. Types of academic activities during the period of the HE program mastering for *part-time* study

Types of academic activities		HOURS	Semesters				
			A	-	-	-	
Contact academic hours		72	72	-	-	-	
including							
Lectures		18	18	-	-	-	
Lab work		54	54	-	-	-	
Seminars (workshops/tutorials)		-	-	-	-	-	
Self-study		26	26	-	-	-	
Evaluation and assessment (exam/pass/fail grading)		10	10	-	-	-	
Course workload		Academic hour	108	108	-	-	-
		Credit unit	3	3	-	-	-

5. CONTENT OF THE DISCIPLINE

Table 5.1 Content of the discipline (module) by type of academic work

Name of the discipline section	Content of the section (topics)	Types of academic

		activities
Section 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.
Section 2. Viral diseases of fish	Topic 2.1 Fish vibriosis.	Lectures, Lab work.
	Topic 2.2 Spring viremia of carp (VVC).	Lectures, Lab work.
Section 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.
Section 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.
Section 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.
Section 6. Helminthiasis of fish. Monogenoidosis. Cestodoses	Topic 6.1 Aeromonosis.	Lectures, Lab work.
	Topic 6.2 Bacterial renal disease of salmon.	Lectures, Lab work.
Section 7. Helminthiasis of fish. Trematodoses. Nematodes	Topic 7.1 Yersiniosis.	Lectures, Lab work.
	Topic 7.2 Myxobacterioses.	Lectures, Lab work.
Section 8. Crustaceoses and other parasitoses	Topic 8.1 Pseudomonosis.	Lectures, Lab work.
Section 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.
Section 10. Veterinary-sanitary and preventive measures at fish farms.	Topic 10.1 Branchiomycosis. Deep mycosis.	Lectures, Lab work.

6. CLASSROOM INFRASTRUCTURE 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 discipline (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. RECOMMENDED SOURCES FOR COURSE STUDIES

Main reading:

- 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 Reading:

- 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.

Resources of the Internet information and telecommunication network:

1. Electronic library system of RUDN and third-party Electronic library systems to which university students have access on the basis of concluded contracts:

- Electronic library system of RUDN - ELS RUDN <http://lib.rudn.ru/MegaPro/Web>
- ELS "University Library online" <http://www.biblioclub.ru>
- ELS Yurayt <http://www.biblio-online.ru>
- ELS "Student Consultant" www.studentlibrary.ru
- ELS "Lan" <http://eZlanbook.com/>
- ELS "Trinity Bridge" <http://www.trmost.com/>

2. Databases and search engines:

- electronic fund of legal and regulatory and technical documentation <http://docs.cntd.ru/>
- search engine Yandex <https://www.yandex.ru/>
- search engine Google <https://www.google.ru/>
- abstract database SCOPUS <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 discipline "**Fish pathology and aquaculture**".
2. Laboratory workshop on the discipline "**Fish pathology and aquaculture**".

* - All educational and methodological materials for independent work of students are placed in accordance with the current procedure on the discipline page in the **Telecommunication educational and Information System!**

8. MID-TERM ASSESSMENT

Evaluation materials and a point-rating system* for assessing the level of competence formation (part of competencies) based on the results of mastering the discipline "**Fish pathology and aquaculture**" are presented in the Appendix to this Work Program of the discipline.

* - Assessment Materials and a Point Rating System are formed based on the requirements of the relevant local regulatory act of the RUDN.

DEVELOPER:

Associate Professor of the Department of Veterinary
Medicine

Position, Basic curriculum

Drukovsky S.G.

Signature

Full name.

HEAD OF THE DEPARTMENT:

Department of Veterinary Medicine

Name Basic Curriculum

Vatnikov Yu.A.

Signature

Full name.

HEAD OF THE HIGHER EDUCATION PROGRAM:

Director of the Department of Veterinary Medicine

Position, Basic curriculum

Signature

Vatnikov Yu.A.

Full name