MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
SUMY NATIONAL AGRARIAN UNIVERSITY

Anatomy, normal and pathological animal physiology Department
Faculty of Veterinary Medicine

MODULE SYLLABUS

Ichthyopathology
(selective)

Implemented in the "Veterinary Medicine" Academic Program

Area of specialization 211 "Veterinary Medicine"

at the second (master's) level of higher education

Sumy-2021

Author: **Kovalenko L.M.** Candidate of Veterinary Sciences (comparable to the academic degree of Doctor o
Fhilosophy, Ph.D.). (_____)

Module syllabusagreed at the anatomy, normal and pathological animal physiology Departmentmeeting	Minutes No 15 dated June 23/ 2021
	Head of anatomy, normal and pathological animal physiology Department d.vet.s., Professor _____ (Rambur M.D.)

Approved by:

Guarantor of the Academic program _____(O. E. Shkromada)

Dean of the Faculty _____(O.L. Nechiporenko)

Syllabus review (attached) is providedby : _____ (O.E. Kasjanenko)

_____ (A.N. Kalashnik)

Representative of the Department of Education Quality assurance, licensing and accreditation _____ (Н. Бараніна)

Registered in electronic data base 25.08. 2021

Syllabus review data:

The academic year in which changes are made	The Academic program attachmentnumber with changes description	Changes revised and approved		
		Minutes No and date of the department meeting	Head of Department	Guarantor of the Academic program

MODULE OVERVIEW

1.	Title	**Ichthyopathology**			
2.	Faculty/Department	Veterinary Medicine/ anatomy, normal and pathological animal physiology			
3.	Type (compulsory or optional)	selective			
4.	Program(s) to which module is attached (to be filled in for compulsory types)				
5.	Module can be suggested for (to be filled in for optional types)	**Ichthyopathology** 211 "Veterinary Medicine"			
6.	Level of the National Qualifications Framework	at the second (master's) level of higher education			
7.	Semester and duration of module	1th semester, 15 weeks			
8.	ECTS credits number	5			
9.	Total workload and time allotment	Directed study			Self-directed study
		Lectures	Practicals	Labs	
		16		**30**	**104**
10.	Language of instruction	English			
11.	Module leader	Lydia Mikhailovna Kovalenko, Candidate of Veterinary Sciences (comparable to the academic degree of Doctor of Fhilosophy, Ph D).			
12.	Module leader contact information	KovalenkoLm4@gmai1.com https://vet.snau.edu.ua/en/			
13.	Module description	The educational component is related to the general objectives of the OP and covers aspects of the formation of a modern specialist veterinarian in-depth theoretical knowledge on the study of general patterns of fish diseases; practical skills in laboratory research methods. Knowledge provides an opportunity to ensure sustainable veterinary welfare of fisheries, high quality fish products dangerous to human consumption.			
14.	Module aim	training of highly qualified specialists who are able to solve complex issues in the conditions of production related to the formation of deep theoretical knowledge on the study of general and temporal patterns of fish diseases; practical skills in laboratory research methods in the examination of sick and suspected fish.			
15.	Module Dependencies (prerequisites, co-requisites, incompatible modules)	1. The educational component is based on OK 18. Veterinary microbiology and immunology, OK 19. Veterinary virology, OK 21. Veterinary pharmacology. The educational component is aimed at studying the following issues: veterinary and sanitary measures that contribute to the efficiency of fisheries; means of disinfection and disinfection of ponds; study of infectious diseases of fish by etiology are viral diseases, bacterial diseases, fungal diseases; study of invasive and non-communicable fish diseases.			

		2. The educational component is the basis for OK 26. Parasitology and Invasive Diseases, OK 30 Epizootology and Infectious Diseases and is the basis for developing the ability of veterinary specialists to apply the acquired knowledge, skills, abilities to learn certain practical techniques and develop skills in working conditions.
16.	The policy of academic integrity	No manifestations of academic dishonesty are allowed during the study of the OK. Plagiarism check algorithm systems are tools for counteracting violations of academic integrity. In case of violations, the response is in accordance with the regulations on the academic integrity of participants in the educational process in Sumy NAU. If a violation of academic integrity is detected, the completed task is not credited and is sent for re-execution.
17	Link in Moodle	(https://snau.edu.ua/viddil-zabezpechennya-yakosti-osviti/zabezpechennya-yakosti-osviti/akademichna-dobrochesnist/)

2. CORRELATION BETWEEN MODULE LEARNING OUTCOMES (MLOs) AND PROGRAM LEARNING OUTCOMES (PLOs)

MLOs: On successful completion of the module the learner will be able to:	**PLOs**						**How assessed**
	PLOs 1	**PLOs 2**	**PLOs 3**	**PLOs 4**	**PLOs 5**	**PLOs 6**	
MLOs1. Use information from domestic and foreign sources to develop diagnostic, treatment and business strategies in the training and performance of professional tasks related to veterinary and sanitary measures that promote the effectiveness of fisheries.	+						Thematic survey Execution of tasks in laboratory-practical classes
MLOs 2. Establish a link between clinical manifestations of the disease and the results of laboratory studies		+					Thematic survey Execution of tasks in laboratory-practical classes

and justify the choice of effective methods for diagnosis, treatment and prevention of bacterial, viral and fungal diseases of fish							
MLOs 3. Formulate conclusions on the effectiveness of selected methods and means of disinfection and disinfection of ponds, tools, equipment, transport, containers, overalls, hatcheries, maintenance, feeding and treatment, prevention of infectious and non-communicable diseases, as well as production and technological processes.			+				Thematic survey Execution of tasks in laboratory-practical classes
MLOs 4. Monitor the causes of the spread of diseases of various etiologies and biological contamination of the environment with livestock waste, as well as materials and veterinary products. Poisoning of fish by pesticides, herbicides, poor quality feed.	+			+			Thematic survey Execution of tasks in laboratory-practical classes
MLOs 5. Develop measures to protect the					+		Thematic survey Execution

population from diseases common to animals and humans. Identification of anthropozoonoses. Conduct hydrochemical research of reservoirs.							of tasks in laboratory-practical classes
MLOs 6. To offer and use expedient innovative methods and approaches to solving problem situations of professional origin. Direct veterinary and sanitary measures that promote the efficiency of fisheries.	+					+	Multiple choice exam

3. MODULE INDICATIVE CONTENT

Autumn semester

Topics	**Distribution of hours**				**Learning resources**
	Directed study			**Self-directed study**	
	Lectures	**Practicals**	**Labs**		No (from the list of Learning resources)
Topic 1. Veterinary and sanitary measures that promote the efficiency of fish farming. Disinfection and disinfection of ponds, fishing gear, equipment, transport, containers, overalls, hatcheries.	2		4	16	[1, 4]
Topic 2. Infectious diseases of fish. Viral diseases: spring viremia of carp, viral hemorrhagic septicemia of trout. Bacterial diseases: carp aeromonosis, pseudomonosis, enteric disease.	2		4	18	[2,4,5]
Topic 3. Infectious diseases of fish. Fungal diseases: bronchiomycosis, saprolegniosis, ichthyosporidiosis	2		4	16	[1, 2, 4]
Topic 4. Invasive fish diseases.	2		4	18	[3, 5]

Protozoa. Disputes.					
Topic 5. Invasive fish diseases. Helminthiasis: monogenoidosis, trematodes, cestodes, nematodes.	2		4	10	[1,2,4]
Topic 6. Non-communicable diseases of fish. Alimentary diseases: avitaminosis, hypervitaminosis.	2		4	8	[7, 6]
Topic 7. Non-communicable diseases. Functional diseases.	2		4	10	[1, 5, 6]
Topic 8. Fish poisoning. Poisoning of fish by pesticides, herbicides, substandard feed.	2		2	8	[1, 3, 7]
Total for the fall semester	**16**		**30**	**104**	

4. TEACHING AND LEARNING METHODS

MLOs	Teaching methods (directed study)	Hours	Learning methods (self-directed study)	Hours
MLOs 1 Model and conduct modern methods for diagnosing bacterial diseases of fish.	**Methods of teaching by source of knowledge:** **Verbal:** story, explanation, conversation (heuristic and reproductive), lecture, instruction. **Visual:** demonstration, illustration, observation. **Active methods:** (use of technical means of training and problem situations, classes in production, group research, use of training and control tests) **Interactive teaching methods:** (use of multimedia technologies, spreadsheets, case-study (method of analysis of specific situations), dialogue learning, student cooperation (cooperation)	4	**Methods of learning by source of knowledge:** **Verbal:** work with a book (reading, translation, writing, taking notes, making tables, graphs, reference notes), **Visual:** observations. Teaching methods by the nature of the logic of cognition (analytical, synthesis methods, inductive method, deductive method). **Active methods** (brainstorming, binary classes, group research). **Interactive learning technologies** (use of multimedia technologies, dialogue learning, student cooperation) Self-study, analysis, preparation of multimedia reports on materials: the role of fish in the spread of some infectious human diseases.	16

MLOs 2 Develop and implement methods for diagnosing viral diseases of fish	**Methods of teaching by source of knowledge:** **Verbal:** story, explanation, conversation (heuristic and reproductive), lecture, instruction. **Visual:** demonstration, illustration, observation. **Active methods:** (use of technical means of training and problem situations, classes in production, group research, use of training and control tests) **Interactive teaching methods:** (use of multimedia technologies, spreadsheets, case-study (method of analysis of specific situations), dialogue learning, student cooperation (cooperation)	4	**Methods of learning by source of knowledge:** **Verbal:** work with a book (reading, translation, writing, taking notes, making tables, graphs, reference notes), **Visual:** observations. Teaching methods by the nature of the logic of cognition (analytical, synthesis methods, inductive method, deductive method). **Active methods** (brainstorming, binary classes, group research). **Interactive learning technologies** (use of multimedia technologies, dialogue learning, student cooperation (cooperation). Self-study, analysis, preparation of multimedia reports on the materials: Skin ulcers in pike perch. Sporadic fish diseases	18
MLOs 3 Carry out an autopsy according to the methods of diagnosing fish mycoses.	**Methods of teaching by source of knowledge:** **Verbal:** story, explanation, conversation (heuristic and reproductive), lecture, instruction. **Visual:** demonstration, illustration, observation. **Active methods:** (use of technical means of training and problem situations, classes in production, group research, use of training and control tests) **Interactive teaching methods:** (use of multimedia technologies, spreadsheets, case-study (method of analysis of specific situations), dialogue learning, student cooperation (cooperation)	4	**Methods of learning by source of knowledge:** **Verbal:** work with a book (reading, translation, writing, taking notes, making tables, graphs, reference notes), **Visual:** observations. Teaching methods by the nature of the logic of cognition (analytical, synthesis methods, inductive method, deductive method). **Active methods** (brainstorming, binary classes, group research). Interactive learning technologies (use of multimedia technologies, dialogue learning, cooperation of students (cooperation). Self-study, analysis, preparation of multimedia reports on materials: Sporozoic fish diseases. Pike plague.	16

MLOs 4 Develop and conduct a demonstration of hematological examination of fish.	**Methods of teaching by source of knowledge:** **Verbal:** story, explanation, conversation (heuristic and reproductive), lecture, instruction. **Visual:** demonstration, illustration, observation. **Active methods:** (use of technical means of training and problem situations, classes in production, group research, use of training and control tests) **Interactive teaching methods:** (use of multimedia technologies, spreadsheets, case-study (method of analysis of specific situations), dialogue learning, student cooperation (cooperation)	4	**Methods of learning by source of knowledge:** **Verbal:** work with a book (reading, translation, writing, taking notes, making tables, graphs, reference notes), **Visual:** observations. Teaching methods by the nature of the logic of cognition (analytical, synthesis methods, inductive method, deductive method). **Active methods** (brainstorming, binary classes, group research). **Interactive learning technologies** (use of multimedia technologies, dialogue learning, student cooperation) "Self-study, analysis, preparation of multimedia reports on materials: invasive diseases.	18
MLOs 5 Carry out modeling of diagnostics of invasive fish diseases.	**Methods of teaching by source of knowledge:** **Verbal:** story, explanation, conversation (heuristic and reproductive), lecture, instruction. **Visual:** demonstration, illustration, observation. **Active methods:** (use of technical means of training and problem situations, classes in production, group research, use of training and control tests) **Interactive teaching methods:** (use of multimedia technologies, spreadsheets, case-study (method of analysis of specific situations), dialogue learning, student cooperation (cooperation)	4	**Methods of learning by source of knowledge:** **Verbal:** work with a book (reading, translation, writing, taking notes, making tables, graphs, reference notes), **Visual:** observations. Teaching methods by the nature of the logic of cognition (analytical, synthesis methods, inductive method, deductive method). **Active methods** (brainstorming, binary classes, group research). **Interactive learning technologies** (use of multimedia technologies, dialogue learning, student cooperation (cooperation). Self-study, analysis, preparation of multimedia reports on materials: invasive diseases. Intestinal helminths of fish.	10
MLOs 6 Develop and conduct demonstration methods of functional fish	**Methods of teaching by source of knowledge:** **Verbal:** story, explanation, conversation (heuristic and reproductive), lecture, instruction.	4	**Methods of learning by source of knowledge:** **Verbal:** work with a book (reading, translation, writing, taking notes, making tables, graphs, reference notes),	8

diseases.	**Visual:** demonstration, illustration, observation. **Active methods:** (use of technical means of training and problem situations, classes in production, group research, use of training and control tests) **Interactive teaching methods:** (use of multimedia technologies, spreadsheets, case-study (method of analysis of specific situations), dialogue learning, student cooperation (cooperation)		**Visual:** observations. Teaching methods by the nature of the logic of cognition (analytical, synthesis methods, inductive method, deductive method). **Active methods** (brainstorming, binary classes, group research). **Interactive learning technologies** (use of multimedia technologies, dialogue learning, student cooperation) "Self-study, analysis, preparation of multimedia reports on materials: invasive diseases. Parasitic crustaceans.	
MLOs 7 Conduct hydrochemical studies of reservoirs.	**Methods of teaching by source of knowledge:** **Verbal:** story, explanation, conversation (heuristic and reproductive), lecture, instruction. **Visual:** demonstration, illustration, observation. **Active methods:** (use of technical means of training and problem situations, classes in production, group research, use of training and control tests) **Interactive teaching methods:** (use of multimedia technologies, spreadsheets, case-study (method of analysis of specific situations), dialogue learning, student cooperation (cooperation)	4	**Methods of learning by source of knowledge:** **Verbal:** work with a book (reading, translation, writing, taking notes, making tables, graphs, reference notes), **Visual:** observations. Teaching methods by the nature of the logic of cognition (analytical, synthesis methods, inductive method, deductive method). **Active methods (**brainstorming, binary classes, group research). **Interactive learning technologies** (use of multimedia technologies, dialogue learning, student cooperation) "Self-study, analysis, preparation of multimedia reports on materials: invasive diseases. Nematodes that affect humans from fish, gnathostomatosis.	10
MLOs 8 Carry out modeling of diagnostics of fish poisonings and general principles of their	**Methods of teaching by source of knowledge:** **Verbal:** story, explanation, conversation (heuristic and reproductive), lecture, instruction. **Visual:** demonstration, illustration, observation. **Active methods:** (use of technical means of training	2	**Methods of learning by source of knowledge:** **Verbal:** work with a book (reading, translation, writing, taking notes, making tables, graphs, reference notes), **Visual:** observations. Teaching methods by the nature of the logic of cognition (analytical,	8

prevention.	and problem situations, classes in production, group research, use of training and control tests) **Interactive teaching methods:** (use of multimedia technologies, spreadsheets, case-study (method of analysis of specific situations), dialogue learning, student cooperation (cooperation)		synthesis methods, inductive method, deductive method). **Active methods** (brainstorming, binary classes, group research). **Interactive learning technologies** (use of multimedia technologies, dialogue learning, cooperation of students (cooperation). Self-study, analysis, preparation of multimedia reports on the materials: Non-communicable fish diseases. Traumatic diseases.	
Total for the fall semester		30		104

5. ASSESSMENT

5.1. Summative assessment

5.1.1. Intended learning outcomes methods:

No	Summative assessment methods	Grades	Deadline
	Autumn semester		
1.	Current control: Thematic survey Execution of tasks in laboratory-practical classes	40 points / 40% 15 points / 15%	4… 13 weeks
2.	Intermediate control	15 points / 15%	8 weeks
3…	Multiple choice test (or written work)	30 points / 30%	Week 16, on schedule

5.2.2. Grading criteria

Summative assessment method	Unsatisfactory	Satisfactory	Good	Excellent
Current control	**<24 points**	**25-40 points**	**41-54 points**	**55 points**
	Task requirements not met.	Most of the requirements are met, but some components are missing or insufficiently disclosed, there is no analysis of other approaches to the issue. Partially reproduced knowledge based	Most of the requirements are met, but some components are missing. Reproduced knowledge of directly presented material within the program with some evidence of	Most of the requirements are met, but some components are missing. Reproduced knowledge of directly presented material within the program with some evidence of broader research.

		on directly presented material within the program.	broader research.	
Intermediate control	**<3 points**	**4-10 points**	**11-14 points**	**15 points**
	Task requirements not met	Most of the requirements are met, but some components are missing or insufficiently disclosed, there is no analysis of other approaches to the issue	Most of the requirements are met, but some components are missing	Al rechurements of the task are fullfield, creativity, thugfulness is shown, ovn solution of a problem s offfered
Multiple choice exam (or written work)	**<11 points**	**12-20 points**	**26-29 points**	**30 points**
	Task requirements not met	Most of the requirements are met, but some components are missing or insufficiently disclosed, there is no analysis of other approaches to the issue	Most of the requirements are met, but some components are missing	All requirements of the task are fulfilled, creativity, thoughtfulness is shown, own solution of a problem is offered

5.3. Formative assessment

Formative exercises are designed to enable students to develop particular aspects of their learning, prior to summative assessments. Formative exercises are designed to help students use feedback and self-reflection to manage and develop theirlearning so that they can see how to improve their work.

No	**Formative Assessment elements**	**Date**
	Autumn semester	
1.	Oral feedback after studying topics 1-3, 4-8	3 weeks
2.	Written feedback topics 1-3	Within 1 week after assembly
3.	Testing after studying topics 4-8	7 weeks
4.	Intermediate control	According to the schedule
5.	Oral feedback after studying topics 7-8	12 weeks
6.	Written feedback on topics 8	Within 1 week after assembly
7.	Testing after studying topics 5-8	14 weeks
8.	Current control (testing, generalization of points) 15 weeks	15 weeks
9.	Multiple choice exam (or written work)	Week 16

Self-assessment can be used both an element of formative and summative assessment.

6. LEARNING RESOURCES

6.1. Key resources

1. Bauer ON, Musselius VA, Strelkov Yu.L. vykh ryb.S-Pb .: Book, 2010 318 p.
2. Mikityuk PV, Yakubchak VM Diseases of fish. Kyiv: Harvest, 2012. 158 p. 4.
3. Bauer ON. Handbook of fish diseases. Baku: Creative, 2005. 340 p.
4. Bauer ON, Musselius VA, Strelkov YL Diseases of pond fish. С-Пб .: Книга, 2010 3118 с.

6.2. Additional resources

5.Osetrov VS Diseases of fish. Directory. Minsk: izd.OPP, 2008. 288 p.
6. Tovstik VF, Sklyarov GA Growing pond fish. Kiev .: Harvest, 2001. 108 p.
7. Kovalenko LM, Kovalenko OI, Kalashnik OM, Pikhtireva AV Methodical instructions. Pathogenic effect of environmental factors. Mechanism of radiation damage and recovery. Sumy, 2018. 24 p.

6.3. Computer Applications and soft

1. MOODL platforms; "ZOOM"; "Viber"; Facebook.