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**Ministry of Education and Science of Ukraine**  
**Sumy National Agrarian University**  
Biological and technological faculty  
Department of feed technology and animal feeding

**Work program ( syllabus ) of the educational component**  
**Animal welfare in aquaculture and public aquariums** (selective)  
It is implemented within the educational program **Aquaculture**

in specialty **204 - Technology of production and processing of animal products**  
at the second (master's) level of higher education

Sumy - 2024



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Developer:  O.B., Kyselov associate professor of the department of feed technology and animal feeding

Considered, approved and approved at the meeting of the Department of Feed Technology and Animal Feeding	protocol from "06" 06 2024 year No. 10
	Head department <u></u> <b>Viktor OPARA</b> (signature) (surname, initials)

**Agreed:**

Guarantor of the educational program  Viktoriia VECHORKA

Dean Biology and Technology  Viktoriia VECHORKA

Review of the work program (attached) provided:  V. Popsuy  
 (surname)

Igor Rubtsov  
 (surname)

Methodist of the Education Quality Department, licensing and accreditation  N. Banonik  
 (surname)

Registered in the electronic database: date: 14.08 2024.

## Information on revision of the work program ( syllabus ):

The academic year in which the changes are made	The number of the annex to the work program with a description of the changes	The changes were reviewed and approved		
		Date and number of the protocol of the meeting of the department	Head of Department	Guarantor of the educational program

## 1. GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT

	The name is OK	Animal welfare in aquaculture and public aquariums					
	Faculty/department	Biological-technological /Technology of fodder and animal feeding					
	The status is OK	Selective					
	Program/Specialty (programs), the component of which is OK for						
	OK can be offered for	204 Technology of production and processing of animal products 207 Aquatic biological resources and aquaculture					
	NRK level	seventh					
	Semester and duration of study	third, 11 weeks					
	Number of ECTS credits	5					
	The total number of hours and their distribution	Contact work (class)					
		Lectures		Practical/seminar		Independent work	
		daytime	extramural	daytime	extramural	daytime	extramural
		22	-	22	-	-	106
	Language of education	Ukrainian					
	Teacher/Coordinator of the educational component	Oleksandr Kyselov					
11.1	Contact Information	Assistant of the Technology of production and processing of animal products and cinology department office 320 of the main building email _ address: <a href="mailto:Kyselov_SNAU@ukr.net">Kyselov_SNAU@ukr.net</a> consultations: every Tuesday 14 :00-15:00.					
	General description of the educational component	The discipline contributes to the formation of in-depth professional knowledge of students animal welfare in aquaculture and public aquariums as a whole and its individual components both at the global level and at the level of the enterprise (fish farm) in order to ensure the sustainable development of territories and ecologically oriented agriculture. The discipline ensures the development in students of the ability to analyze the welfare of animals in aquaculture and public aquariums , technical equipment, the features of the use of specialized feeds and chemicals, and of course the knowledge and ability to select and maintain optimal environmental conditions for biota and the compatibility of representatives of flora and fauna					
	The purpose of the educational component	Educational component: - aimed at mastering a wide range of modern methods of improving the treatment of animals in aquaculture and public aquariums , the specifics of creating natural water ecosystems in aquariums					

		<ul style="list-style-type: none"> <li>- studies the treatment of animals in aquaculture and public aquariums as a set of measures to optimize the rational use of natural and artificial water resources, fish species and aquatic microorganisms, technologies and production systems;</li> <li>- will get acquainted with various innovative methods of production technologies of aquaculture products and the organization of its functioning .</li> </ul>
	Prerequisites for studying OK, connection with other educational components of OP	The educational component is based on the educational components " Aquaculture production technology "
	Policy of academic integrity	<p>The policy of academic integrity at SNAU is governed by the Code of Academic Integrity  <a href="http://docs.snau.edu.ua/documents/education/quality/kodeks_akadem_dobrochesnosti.pdf">http://docs.snau.edu.ua/documents/education/quality/kodeks_akadem_dobrochesnosti.pdf</a></p> <p>In accordance with it, the requirements for the student to observe academic integrity during the study of the educational component are as follows:                      responsible for one's duties, to fulfill the tasks prescribed by the educational program on time and in good faith; to be present at all classes; perform independent work; honestly and responsibly prepare for current, modular and final control; submit for assessment only self-made work.</p> <p>It is unacceptable for a student to:                      show a disrespectful and incorrect attitude towards the teacher; being late for classes and missing them without valid reasons; during the educational process, use hints, other people's work, telephones; provide and receive assistance from third parties during current, modular and final control; receive or offer a bribe for receiving any benefits in educational activities.</p> <p>For violating the rules of academic integrity, students may be held liable for the following forms of responsibility:</p> <ul style="list-style-type: none"> <li>- repeated assessment (test, exam, credit, etc.);</li> <li>- repeated completion of the training course;</li> <li>- warning;</li> <li>- issuing a reprimand;</li> <li>- expulsion from the university (Part 5 of Article 48 of the Law of Ukraine "On Education");</li> </ul>
	Link to the course in the Moodle system	<a href="https://cdn.snau.edu.ua/moodle/course/view.php?id=5708">https://cdn.snau.edu.ua/moodle/course/view.php?id=5708</a>

## 2. LEARNING RESULTS UNDER THE EDUCATIONAL COMPONENT AND THEIR RELATIONSHIP WITH PROGRAM LEARNING OUTCOMES

Study results for OK:	How RND is estimated
DRN1. Use knowledge and understanding of the biological features of fish and fish when determining the safety and quality indicators of aquatic biological resources and aquaculture facilities and their products	Essay
DRN2. Have knowledge of fish physiology. Use acquired skills in these areas. Interpret the general patterns underlying the physiological processes of a living organism. Draw a conclusion about the state of physiological functions of the body, its systems and organs. Plan, organize, conduct a physiological experiment, analyze its results. Understand and solve complex specialized tasks and practical problems in the production and cultivation of aquatic biological resources and aquaculture	Report, Testing
DRN3 . To be able to detect the influence of hydrochemical and hydrobiological parameters of the aquatic environment of aquariums on the physiological state of their inhabitants - aquarium fish, invertebrates, plants. To know the taxonomy and physiological features of ornamental fish. To be able to perform hydrochemical, hydrobiological, and ichthyopathological studies in order to diagnose diseases of aquarium fish, evaluate their course, effectiveness of prevention and treatment. To be able to provide rational feeding of objects of decorative aquaculture. Know about the need to use live feed and about the dangers that may arise in doing so	Research proposal, testing

### 3. CONTENTS OF THE EDUCATIONAL COMPONENT (COURSE PROGRAM)

<b>Topic.</b> <b>List of issues to be considered within the topic</b>	<b>Distribution within the general time budget</b>			<b>Recom mende d Books</b>
	<b>Auditory work</b>		<b>SRS</b>	
	<b>Lk</b>	<b>Pz</b>		
<b>Topic 1.</b> History of aquaculture development 1. Introduction. 2. The main trends in the development of aquaculture. 3. Prospects for the development of aquaculture. 4. Goals and objectives of aquaculture. 5. The main problems of aquaculture. 6. Aquaculture as a branch of national economy.	4	4	12	1, 2, 3, 4, 5, 6
<b>Topic 2. Welfare of animals in aquaculture</b> 1. Concepts of well-being. 2. Aquaculture processes and factors that may be critical to fish welfare 3. Fish (species, life stage, domestication). Management technique. Water quality (physical, chemical parameters). Planting density. Growing environment. Transportation and transportation. 4. Slaughter. Do fish feel pain? Nervous system and brain of fish. 5. Prevention and prevention of diseases. 6. List of requirements for the cultivation of individual aquaculture facilities. 7. Global trends in the use of antibiotics in aquaculture.	2	2	12	8, 9, 10, 11, 12, 14, 15, 16, 17, 18
<b>Topic 3. Main groups of aquarium fish</b> 1. Introduction. 2. Ecological and biological features of labyrinth fish. 3. Ecological and biological features of cichlid fish. 4. Ecological and biological features of carp fish. 5. Water environment and its inhabitants. 6. Fish and seafood.	2	2	10	1, 2, 3, 4, 5, 6
<b>Topic 4. Accounting of aquatic invertebrates.</b> 1. Peculiarities of functioning of aquatic biocenoses. 2. Meteorological observations. 3. Physical factors of the water environment.	2	2	12	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
<b>Topic 5. The history of the creation and development of aquarium science .</b> 1. Theoretical foundations of aquarium science . 2. Material and technical base: equipment and equipment. 3. Material and technical base: chemistry and fodder. 4. Fauna of decorative aquaculture. 5. Flora of decorative aquaculture. 6. Decoration and aqua design . 7. Maintenance of the aquarium system and maintenance of homeostasis. 8. Public aquariums . 9. Commercial aquariums. General requirements. Kinds	4	4	12	1, 2, 3, 4, 5, 6, 8, 12, 13

<b>Topic.</b> <b>List of issues to be considered within the topic</b>	<b>Distribution within the general time budget</b>			<b>Recom mende d Books</b>
	<b>Auditory work</b>		<b>SRS</b>	
	<b>Lk</b>	<b>Pz</b>		
10. Oceanariums.				
<b>Topic 6. Technical equipment and its purpose in the aquarium system.</b> <ol style="list-style-type: none"> <li>Hydrological, hydrochemical, biological indicators and their influence on the aquarium system.</li> <li>Fauna of the aquarium system, compatibility and use in aqua design .</li> <li>Flora of the aquarium system, compatibility and use in aqua design .</li> <li>Aqua design and its creation.</li> <li>Technical aspects of maintaining stability in the aquarium system.</li> </ol>	2	2	12	1, 2, 3, 4, 5, 7, 10
<b>Topic 7. Types of aquariums and their preparation for use.</b> <ol style="list-style-type: none"> <li>The history of the development of decorative aquarism</li> <li>The main types and forms of aquariums and their construction</li> <li>Preparation, installation and use of aquariums of various types.</li> <li>Aquarium hydrochemistry and water preparation.</li> <li>Soil and means of interior decoration of the aquarium</li> <li>Technical equipment of the aquarium.</li> <li>Water aeration (choice of vibrocompressors , air pumps, sprayers).</li> </ol>	2	2	12	1, 2, 3, 4, 5, 7, 11
<b>Topic 8. Peculiarities of caring for aquarium hydrobionts .</b> <ol style="list-style-type: none"> <li>Fish feeding and use of fertilizers in aquarium science</li> <li>Feeding aquarium fish fry. Types of live feed for aquarium fish.</li> <li>Care of aquariums of various types.</li> <li>Transportation rules, main diseases, methods of treatment and prevention of fish and plant diseases</li> <li>Acclimatization and selection of objects of decorative aquaculture.</li> </ol>	2	2	12	1, 2, 3, 4, 5
<b>Topic 9. Objects of aquarium science , main representatives.</b> <ol style="list-style-type: none"> <li>The main representatives of plants in the aquarium</li> <li>The main representatives of freshwater aquarium fish.</li> <li>The main representatives of marine aquarium fish.</li> <li>Molluscs, crustaceans and other invertebrates in the aquarium</li> <li>Technologies for maintaining and growing freshwater and marine ornamental hydrobionts (reptiles, amphibians).</li> <li>External signs, biology and features of keeping and breeding freshwater and marine crustaceans: shrimps, crayfish, crabs.</li> <li>Basics of aqua design . Basics of aquascaping .</li> </ol>	2	2	12	1, 2, 3, 4, 5, 9, 14
<b>That's all</b>	<b>22</b>	<b>22</b>	<b>106</b>	



#### 4. TEACHING AND LEARNING METHODS

DRN	Teaching methods (work to be carried out by the teacher <u>during classroom classes</u> , consultations)	Number of hours	Study methods (what types of educational activities should be performed <u>by the student independently</u> )	Number of hours
DRN 1	Educational lecture (narration, explanation, demonstration, illustration) Practical lesson (explanation, demonstration)	4	Working with lecture notes, working with books, working with regulatory and legal acts, generalization, systematization, deepening of the material, calculations, development of a civil protection plan	4
DRN 2	Educational lecture (narration, explanation, demonstration, illustration) Practical lesson (explanation, demonstration)	36	Working with lecture notes, working with books, working with regulatory and legal acts, generalization, systematization, deepening of the material, calculations	92
DRN 3	Educational lecture (narration, explanation, demonstration, illustration) Practical lesson (explanation, demonstration)	4	Working with lecture notes, working with books, working with regulatory and legal acts, generalization, systematization, deepening of the material, calculations	10

## 5. EVALUATION BY THE EDUCATIONAL COMPONENT

### 5.1. Diagnostic assessment (specified as necessary)

### 5.2. Summative assessment

5.2.1. To assess the expected learning outcomes, it is provided

No	Methods of summative assessment	Points / Weight in the overall assessment	Compilation date
1.	Essay, Topic 1	15/15%	3 semester, 3 week
2.	Written test, Topic 1-3	15/15%	3 semester, 4 week
3.	Intermediate certification, Topic 1-3	15/15%	3 semester, 4 week
4.	Report, Topic 4 - 5	15/15%	3 semester, 6 week
5.	written testing , Topic 6 - 9	15/15%	3 semester, 7 week
6.	Research proposal, Topic 9	25/25%	3 semester, 11 week

5.2.2. Evaluation criteria

Component	Unsatisfactorily	Satisfactorily	Fine	Perfectly
Essay, Topic 1	<9 points	9-11 points	12-13 points	14-15 points
	Task requirements not met	Most of the requirements are fulfilled, but some parts are missing, there is no analysis of the received data	All requirements of the task have been fulfilled	All requirements of the task have been fulfilled, the obtained results have been clearly interpreted
Written test, Topic 1-3	<5 points	5-6 points	7-8 points	9-15 points
	Fewer than 6 correct answers to a test question	6-9 correct answers to the test questions	10-12 correct answers to the test questions	13 -15 correct answers to the test questions
Intermediate certification	<9 points	9-11 points	12-13 points	14-15 points
	Fewer than 6 correct answers to a test question	6-9 correct answers to the test questions	10-12 correct answers to the test questions	13 -15 correct answers to the test questions
Report Topic 4-5	<9 points	9-11 points	12-13 points	14-15 points
	Task requirements not met	The presentation does not correspond to the content of the report, the report is not properly prepared, does not meet the requirements	The presentation corresponds to the content of the report, but the report is not properly prepared	The presentation corresponds to the content of the report, but the report is properly prepared
	< 10	11-12	12-14	14-15

written testing , Topic 6-9	Fewer than 6 correct answers to a test question	6-9 correct answers to the test questions	10-12 correct answers to the test questions	13 -1 5 correct answers to the test questions
Research proposal, Topic 9	< 13	14	15-19	20-25
	Task requirements not met	The form is filled out, but the content does not meet the requirements of the topic	The form is filled out, but the research proposal is superficial, the components are not agreed	Filled out form, research proposal of an innovative nature, agreed components in detail

### 5.3. Formative assessment:

To assess the current progress in learning and understand the directions for further improvement is provided

No	Elements of formative assessment	Date
1.	<i>Oral survey after studying the topic</i>	At the next practical session after the presentation of the material on the topic
2.	<i>Verbal feedback from the teacher and students after the presentation of the essay</i>	Immediately after the end of the presentation
3.	<i>Verbal feedback from the teacher while working on individual tasks during classes</i>	At the next class after the student has completed the assignment

## 6. EDUCATIONAL RESOURCES (LITERATURE)

### Main sources

#### Textbooks and manuals

- Intensive technologies in aquaculture: training . help \_ / [R. V. Kononenko, P. G. Shevchenko, V. M. Kondratyuk, I. S. Kononenko]. - K.: "Center for Educational Literature", 2016. - 410
- Basics of aquarium science : a study guide for students of higher educational institutions. Vinnytsia, 2020. – 233 p., Ukrainian language.
- Kunovskyi Y.V., Prysiazhniuk N.M., Hrynevych N.E., Mikhalskyi O.R. Biology of objects of decorative aquaculture: methodical instructions for the implementation of practical work for students of the Faculty of Ecology according to the credit-module system of the organization of the educational process/ Yu.V. Kunovskyi . – Bila Tserkva, 2018. – 58 p.
- Sherman I.M., Yevtushenko M.Yu. Theoretical foundations of fish farming: textbook - K.: , 2011. - p.
- Archibisova D.S., Tarasenko S.O. The development of mariculture is an important component of ensuring the sustainable development of the coastal regions of Ukraine. Ensuring the sustainable development of the economy: problems, opportunities, prospects: materials of the International . of science - practice \_ conf . Uzhgorod, 2018. P. 45-47.
- Hrynevych N.E., Prysiazhniuk N.M., Khomyak O.A., Mikhalskyi O.R., Tkach M.V. General ichthyology. Bila Tserkva, 2019. 40 p.
- Law of Ukraine "On Fish Farming, Industrial Fishing and Protection of Aquatic Bioresources" dated July 8, 2011 No. 3677.
- FAO. 2020. Progress Towards Development of the Progressive Management Pathway for Improving Aquaculture Biosecurity (PMP/AB): Highlights of 2019 Activities. FAO Fisheries and Aquaculture Circular No. 1211, Rome. <https://doi.org/10.4060/cb0560en>

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12. FAO. 2018. The State of World Fisheries and Aquaculture 2018 - Meeting the sustainable development goals. Rome. License: CC BY-NC-SA 3.0 IGO.

### Other sources

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2. Law of Ukraine "On Fish Farming, Industrial Fishing and Protection of Aquatic Bioresources" dated July 8, 2011 No. 3677.
3. Modeling technological processes in aquaculture. Methodical instructions for laboratory work for students of full-time and part-time education of the second master's degree of the faculty of technology of production and processing of animal husbandry products, specialty - 207 "Water bioresources and aquaculture" PBB BHAY, 2018. 75 p.
4. Jeremy Gay The Perfect Aquarium : The Complete Guide that Settings Up and Maintaining an Aquarium . 2005. 256 c.
5. [https://darg.gov.ua/akvakuljtura\\_z\\_chogo\\_0\\_1\\_0\\_8315\\_1.html](https://darg.gov.ua/akvakuljtura_z_chogo_0_1_0_8315_1.html)
6. <https://opencages.com.ua/blog/can-fish-feel-pain>.

### Additional sources

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  18. FAO Committee he Fisheries / Comité Dec Pêches de la FAO/ Comité de Pesca de la FAO. 2019c. Report of the Tenth Session of the Sub-Committee he Aquaculture . Trondheim , Norway , 23–27 August 2019 / Rapport de la tenth session du Sous-Comité de l'aquaculture . Trondheim ( Norway ) , 23-27 août 2019 / Informe de la 10.<sup>a</sup> reunión Del Subcommittee de Acuicultura . Trondheim ( Noruega ) , 23-27 de August de 2019. FAO Fisheries and Aquaculture Report / Rapport de la FAO sur forest pêches et l'aquaculture /FAO, Informe de fishing and aquaculture No. \_ 1287. Rome / Roma , Italy / Italie / Italia . ( available at : <http://www.fao.org/3/ca7417t/CA7417T.pdf>)
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## Software

### 1 . MS Excel

**Review of the work program ( syllabus )**

The parameter by which the work program ( syllabus ) of the educational component is evaluated	So	No	Comment
Learning outcomes for the educational component (DRN) correspond to the NRC			
The results of the study by the educational component (DRN) correspond to the prescribed PRN (for mandatory OKs)			
Learning outcomes by educational component provide an opportunity to measure and evaluate the level of their achievement			

OP project team member \_\_\_\_\_  
 (title) (surname) (signature)

The parameter by which the work program ( syllabus ) of the educational component is evaluated	So	No	Comment
General information about the educational component is sufficient			
The results of the educational component correspond to the NRC			
The results of the study in the educational component correspond to the prescribed national educational requirements (for mandatory OKs)			
Learning outcomes by educational component provide an opportunity to measure and evaluate the level of their achievement			
Learning outcomes relate to students' competencies , not the content of the discipline (contain knowledge, abilities, skills, and not the topics of the discipline's curriculum)			
Educational activity (teaching and learning methods) enables students to achieve the expected learning outcomes			
The educational component involves learning through research			
The assessment strategy within the educational component is in accordance with University/faculty policy			
The provided assessment methods make it possible to assess the degree of achievement of learning outcomes by educational component			
The workload of students is adequate to the volume of the educational component			
Recommended learning resources are sufficient to achieve learning outcomes			
The literature is relevant			

Reviewers (in the department teacher) \_\_\_\_\_  
 (title) (position, full name) (signature)