MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
SUMY NATIONAL AGRICULTURAL UNIVERSITY

Department of Biochemistry and Biotechnology

"I approve"
Head of the department
_____ (Bondarchuk L.V.)

«___» _____ 2020

CURRICULUM WORK PROGRAM

Biosafety in animal husbandry

Specialty: 204 - Technology of production and processing of livestock products

Educational program: 204 - Technology of production and processing of livestock products

Educational degree : Doctor of Philosophy

Faculty: Biological and Technological

2020-2021 academic year

Work program in the discipline of ***Biosafety in Animal Husbandry*** for OS applicants Doctor of Philosophy in specialty 204 - "Technology of production and processing of livestock products"

Developers:

d.s.-g. Science, Professor . (_____) Bordunova O.G.

к. с.-г. Sciences, Associate Professor (_____) Bondarchuk L.V.

The working program was considered at the meeting of the Department of Biochemistry and Biotechnology
Minutes № 11 of 16 June 2020

Head of the Department _____ (**L.V. Bondarchuk**)
(signature)

Agreed:

Guarantor of the educational program _____ (**L.M. Khmelnytsky**)

Head of postgraduate and doctoral studies _____ ( )

1. **Description of the discipline**

<table>
<tr><td rowspan="2">Name of indicators</td><td rowspan="2">Field of knowledge, direction of training, educational and qualification level</td><td>Characteristics of the discipline</td></tr>
<tr><td>full-time education</td></tr>
<tr><td rowspan="2">Number of credits - 5</td><td>Field of knowledge: 20 - "Agricultural Sciences and Food"</td><td rowspan="2">Selective</td></tr>
<tr><td>Specialty 204 - "Technology of production and processing of livestock products"</td></tr>
<tr><td>Modules - 2</td><td rowspan="6"></td><td>Year of preparation:</td></tr>
<tr><td>Content modules: 2</td><td>2020-2021</td></tr>
<tr><td rowspan="3"></td><td>Course</td></tr>
<tr><td>2</td></tr>
<tr><td>Semester</td></tr>
<tr><td rowspan="2">The total number of hours is 150</td><td>4th</td></tr>
<tr><td>Lectures</td></tr>
<tr><td rowspan="10"></td><td rowspan="10">Educational degree - Doctor of Philosophy</td><td>20 years</td></tr>
<tr><td>Practical, seminar</td></tr>
<tr><td>30 years</td></tr>
<tr><td>Independent work</td></tr>
<tr><td>50 years</td></tr>
<tr><td>And ndiv and dual and tasks</td></tr>
<tr><td>50 years</td></tr>
<tr><td>Type of control: examination</td></tr>
</table>

Note. The ratio of hours of classes to separate and individual work is: for full time - 50/ 10 0

2. The purpose and objectives of the discipline

Objective : Acquisition by graduate students of theoretical knowledge on modern issues of biosafety, bioethics and global risks of modern technologies, as well as the acquisition of practical skills necessary for professional activity, the formation of a holistic view of the current state of bioethics and biosafety in Ukraine and the world.

Tasks: - to study the main sources of biological danger and be able to identify them;

- master conceptual approaches to biosafety in the field of animal husbandry;
- to study the most important ethical teachings, categories of moral consciousness, the use of animals by man in agricultural production ;
- to study the biotic aspects of experimental and laboratory research;
- to get acquainted with the legal framework of biosafety and environmental protection.

Program learning outcomes . As a result of studying the courses, graduate students acquire the ability to:

- apply legislation and conventions governing the relationship in the field of biosafety,
- to solve modern problems and problems of biosafety in the field of animal husbandry,
- use biological objects in scientific experiments and in the implementation of educational programs in natural sciences,
- learn the basics of safe work with biological objects of different levels of the organization,
- to ensure opportunities and risks of using nanotechnologies and genetically modified organisms,
- conduct risk assessment procedures for the use of GMOs and GM food raw materials and food products.

3. Curriculum of the discipline

Content module 1.
Biological protection and biological safety

Topic 1. Biosafety system in Ukraine: subject, concepts, principles, directions, formation and functioning. Biosafety as an academic discipline Basic principles of the state system of biological safety The main directions of formation and functioning of biological safety at the state level. Relationship between bioethics and biosafety in modern legislation on environmental protection and use of natural resources.

Topic2. Biosecurity and biosafety . Biological risks: infectious biological risks, intra-laboratory infections, dual use problem, anthropogenic threats. Eliminate safety / accident risks. Elimination of anthropogenic threats.

Topic 3. Modern biotechnology and biosafety issues. History of biotechnology The role of biotechnology in the improvement of the biosphere The use of modern biotechnology in agriculture and other sectors of the economy. Features of virus evolution at the present stage Biotechnology and biosafety in the agricultural industry.

Topic 4. The use of genetically modified organisms and their biosafety. The concept of transgenic organisms and products Use of biotechnology in medicine Possible risks of using products from GM sources. Introduction of new species of organisms and its impact on the environment. Legal regulation of the use of genetically modified organisms in Ukraine and the world.

Topic 5. Biological risk assessment and selection of protection methods . Identification of hazards inherent in the laboratory and their analysis. Areas of risk assessment **.** Algorithm of actions for biological risk management. Methods and means of neutralization of laboratory materials.

Content module 2.

Biosafety in animal husbandry

Topic 6. Methods of working with biological material . Protective equipment (primary and secondary barriers). Requirements for personal protection. Individual protective equipment. Agriculture, forestry and industry and their impact on the environment.

Topic 7. The sequence of work during emergencies

Biological pollution and measures for its elimination Measures for disinfection after biological pollution Procedure for elimination of consequences of accidents and accidents in laboratories Algorithm of actions in case of spillage and / or splashing of biologically dangerous substance inside the biosafety cabinet Algorithm of actions in case of spillage of biologically dangerous substance biosafety cabinets, methods and means of disposal of laboratory materials. Nanotechnology as a strategic direction of evolution of human society.

Topic 8. Biosafety in the field of dairy farming . Sanitary and hygienic requirements for feed and water quality for livestock farms. Sanitary and hygienic requirements for feed quality for livestock complexes. Basic legal acts of the international biosafety system.

Topic 9. Biosafety in poultry. Threats of disease spread. Biosafety in poultry. Legal regulation of biosafety and bioethics.

Topic 10. Biological safety in the field of pig breeding. Safety management system for pig farms, or the so-called compartment. Waste management policy of livestock complexes in Ukraine. Legislation of Ukraine and the world in the field of bioethics.

4. The structure of the discipline

Names of content modules and topics	Number of hours			
	All-him	including		
		Luke	Ex ..	S.R.
1	**2**	**3**	**4**	**5**
Module 1.				
Content module 1 . Biological protection and biological safety.				
Topic 1. Biosafety system in Ukraine: subject, concepts, principles, directions, formation and functioning	10	2	2	10
Topic 2. Biosecurity and biosafety	14	2	4	10
Topic 3. Modern biotechnology and biosafety issues	10	2	2	10
Topic 4. The use of genetically modified organisms and their biosafety	18	2	4	10
Topic 5. Biological risk assessment and selection of protection methods	10	2	2	10
Total hours for 1 module	**74**	**10**	**14**	**50**
Module 2				
Content module 2. Biosafety in animal husbandry				
Topic 6. Methods of working with biological material	12	2	2	10
Topic 7. The sequence of work during emergencies	10	2	2	10
Topic 8. Biosafety in the field of dairy farming	14	2	4	10
Topic 9. Biosafety in poultry	14	2	4	10
Topic 10. Biological safety in the field of pig breeding	14	2	4	10
Total hours for 2 modules	**76**	**10**	**16**	**50**
Total hours	**150**	**20**	**30**	**100**

5. Topics and plan of lectures

№ s / n	Name topics	Number hours
1	**Topic 1. Biosafety system in Ukraine: subject, concepts, principles, directions, formation and functioning** **Plan.** 1. Biosafety as an academic discipline.	2

	2. Basic principles of the state system of biological safety	
2	**Topic 2. Biosecurity and biosafety** **Plan** 1. Biological risks: infectious biological risks, intra-laboratory infections, dual use problem, anthropogenic threats. 2. Reduction and elimination of the impact of dangerous biological factors on humans, animals and the environment.	2
3	**Topic 3. Modern biotechnology and biosafety issues** **Plan** 1. History of biotechnology development. 2. The use of modern biotechnology in agriculture and other sectors of the economy	2
4	**Topic 4. The use of genetically modified organisms and their biosafety** **Plan.** . 1. The concept of transgenic organisms and products 2. The use of biotechnology in medicine 3. Possible risks of using products from GM sources	2
5	**Topic 5. Biological risk assessment and selection of protection methods** **Plan.** 1. Identification of hazards inherent in the laboratory and their analysis. 2. Directions of risk assessment	2
6	**Topic 6. Methods with biological material** **Plan.** 1. Protective equipment (primary and secondary barriers). 2. Requirements for personal protection	2
7	**Topic 7. The sequence of work during emergencies** **Plan.** 1. Biological pollution and measures to eliminate it 2. Measures for disinfection after biological contamination 3. Procedure for liquidation of consequences of accidents and accidents in laboratories	2
8	**Topic 8. Biosafety in the field of dairy farming** **Plan** 1 **.** Sanitary and hygienic requirements for feed quality for livestock complexes 2. Sanitary and hygienic requirements for water quality for livestock complexes	2
9	**Topic 9. Biosafety in poultry** **Plan.** .	2

	1. Threats of disease spread. 2. Assessment of quality and safety of poultry products in Ukraine.	
10	**Topic 10. Biological safety in the field of pig breeding** **Plan.** 1. Safety management system for pig enterprises, or the so-called compartment. 2. Assessment of quality and safety of pig products in Ukraine.	2
	Together	**20**

6. Topics of practical classes

№ s / n	Name topics	Number hours
1	The main directions of formation and functioning of biological safety at the state level	2
2	Eliminate safety / accident risks.	4
3	Features of the evolution of viruses at the present stage	2
4	Introduction of new species of organisms and its impact on the environment.	4
5	Algorithm of actions for biological risk management	2
6	Individual protective equipment	2
7	Algorithm of actions in case of spillage and / or splashing of biologically dangerous substance inside the biosafety cabinet. Algorithm of actions in case of spillage of biologically dangerous substance outside the biosafety cabinet.	2
8	Sanitary and hygienic requirements for feed quality for livestock complexes	4
9	Biosafety in poultry	4
10	Waste management policy of livestock complexes in Ukraine	4
	Together	**30**

7. Independent work

№ s / n	Name topics	Number hours
1	Relationship between bioethics and biosafety in modern legislation on environmental protection and use of natural resources.	5
2	Elimination of anthropogenic threats.	5
3	Biotechnology and biosafety in the agricultural industry	5
4	The role of biotechnology in the rehabilitation of the	5

	biosphere	
5	Methods and means of neutralization of laboratory materials	5
6	Agriculture, forestry and industry and their impact on the environment.	5
7	Nanotechnology as a strategic direction of evolution of human society	5
8	Basic legal acts of the international biosafety system.	5
9	Legal regulation of biosafety and bioethics.	5
10	Legislation of Ukraine and the world in the field of bioethics.	5
	Together	**5 0**

8. Individual tasks.

№ s / n	Name topics	Number hours
1.	Carry out educational activities on biosafety at the livestock complex for cattle	20
2.	Develop measures for potential biological hazards due to the spread of swine diseases.	10
3.	Develop measures to prevent the spread of pathogens in a large poultry farm.	10
4 .	Track mutational changes in the pedigree of dogs of a certain breed.	10
	Together	**5 0**

9. Teaching methods

1. Methods of learning by source of knowledge:

1.1. ***Verbal*** : story, explanation, conversation (heuristic and reproductive), lecture.

1.2. ***Visual*** : demonstration, illustration, observation.

1.3. ***Practical*** : laboratory method, practical work, production and practical methods.

2. Teaching methods by the nature of the logic of cognition.

2.1. ***Analytical*** .

2.2. ***Methods of synthesis*** .

2.3. ***Inductive method*** .

2.4. ***Deductive method*** .

2.5. ***Translational method*** .

3. Teaching methods for the nature and level of independent mental activity of graduate students.

3.1. ***Problem*** (problem-information)

3.2. ***Partial search (heuristic).***

3.3. ***Research.***

3.4. ***Reproductive*** .

3.5. ***Explanatory and demonstrative.***

4. Active teaching methods - use of technical teaching aids, classes, use of problem situations, excursions, classes, group research, self-assessment of knowledge, simulation teaching methods (based on simulation of future professional activity), use of training and control tests, use of reference notes lectures)

5. Interactive technologies - the use of multimedia technologies, interactive whiteboards and spreadsheets, case-study (method of analysis of specific situations), dialogue training.

9. Control methods

1. Rating control according to the 100-point scale of ECTS assessment

2. Carrying out intermediate control during the semester (intermediate certification)

3. Assess the level of knowledge during the discussion of issues raised at the hospital, surveys during the hospital, writing thematic tests and defense of laboratory work; independent writing of abstracts on separate questions is estimated.

4. The final assessment of knowledge takes into account the level of educational work, writing tests, oral answers, intermediate certification, the level of independent work and its protection.

10. Distribution of points received on the test: full-time education

Current testing and independent work										**CPC**	**Together for modules and VTS**	**Final test exam**	**Sum**
Module 1 25 points					**Module 2 3 0 points**								
Z. m. 1					**Z. m. 2**								
T. 1	T. 2	T. 3	T. 4	T. 5	T. 6	T.7	T. 8	T. 9	T. 10				
5	5	5	5	5	6	6	6	6	6	15	70 (55 + 15)	30	100

Assessment scale: national and ECTS

The sum of points for all types of educational	**ECTS assessment**	**Score on a national scale**	
		for exam, course project (work), practice	**for offset**

activities			
90 - 100	**AND**	perfectly	credited
82-89	**IN**	good	
74-81	**WITH**		
64-73	**D**	satisfactorily	
60-63	**IS**		
35-59	**FX**	unsatisfactory with the possibility of reassembly	not credited with the possibility of re-assembly
0-34	**F**	unsatisfactory with mandatory re-study of the discipline	not enrolled with mandatory re-study of the discipline

11. Recommended literature

Basic:

1. Практическое руководство по биологической безопасности в лабораторних условиях. – 3-е изд. – Женева : Всемирная организация здравоохранения, 2004 . – 201 с.

2. Правила влаштування і безпекироботи в лабораторіях (відділах, відділеннях) мікробіологічногопрофілю : ДСП 9.9.5.-080-02 [Чиннийвід 2002-01-28]. – Київ : МОЗ України, Державнасанітарно-епідеміологічна служба, 2002. – 39 с.

3. Сучасні проблеми біоетики / редкол. : Ю. І. Кундієв (відп. ред.) та ін. – К. :Академперіодика, 2009. – 278 с.

4. Відповідальні медико-біологічні дослідження в глобальній безпеці системи охорони здоров'я:методичний документ. – Женева : ВООЗ, 2010. – 70 с.

Auxiliary:

1.Holms C. Riskassessmentforbiologicalthreat [text] // Math. Canadian ABSA branchmeeting, Winnipeg 4-9.06.2010. – P.81-102.

2.Global BiosafetyandBiosecurity: TakingAction [text] // Math. IFBA buildingmeeting, Bangkok, Thailand, 15-17 February 2011. –117 p.