

**NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCES
OF UKRAINE**

Department of Applied Biology, Animal Breeding and Genetics



Dean of the Faculty of Veterinary
Medicine
Aleksandr VALCHUK
_____ 2026

ENDORSED

at the meeting of the Department of Applied
Biology, Animal Breeding and Genetics
No. 12 of «05» of May 2026
Head of the Department

Serhii RUBAN

REVIEWED Guarantor of the EP
“Veterinary Medicine”

Volodymyr MELNYK

AGREED

Chairman of the Bioethics Commission of
NUBiP of Ukraine

Oleh MELNYK

CURRICULUM WORK PROGRAM

FUNDAMENTALS OF ANIMAL BREEDING

Field of Study: N “Agriculture, Forestry, Fisheries and Veterinary Medicine”

Specialty: H6 Veterinary Medicine

Educational Programme: Veterinary Medicine

Faculty: Faculty of Veterinary Medicine

Developer: Associate Professor of the Department of Applied Biology, Animal
Breeding and Genetics, Candidate of Agricultural Sciences, Associate Professor
Iryna SUPRUN

Kyiv – 2026

Description of the discipline. The course is a mandatory component of the educational programme “Veterinary Medicine” within Specialty H6 Veterinary Medicine at the Master’s degree level.

The aim of the course is to provide students with professional knowledge of the biological characteristics of farm animals, the patterns governing their growth, development and productivity, as well as to develop competence in the methods of selection, mating, breeding and genetic improvement with due regard to veterinary considerations.

The programme consists of two content modules covering exterior and interior traits, productivity, breeding value, and the specific features of inbreeding and heterosis.

Completion of the course enables students to acquire the competencies required for evidence-based decision-making in the prevention, diagnosis and treatment of animal diseases, taking into account the animals’ genetic potential and housing technologies.

Field of knowledge, specialty, educational program educational level	
Educational level	Master
Specialty	H6 «Veterinary medicine»
Educational program	Veterinary medicine
Characteristics of the discipline	
Kind	Required
Total hours	120
Amounts of credits ECTS	4
Amount of content modules	2
Course project (work)	-
Form of control	Test
Indicators of academic discipline for full term and reduced period of studying	
	<i>Full term of study</i>
Year of study (course)	2
Semester	3
Lectures	15
Practical, seminar classes	-
Laboratory classes	15
Independent work	90
Amount of weekly classroom hours for full-time education	2 hours

1. Purpose, competencies and program results of the discipline

The purpose is to acquaint future specialists with the objects of their professional work, namely: biological features of different types of agriculture. animals, their individual development, patterns of growth in different age

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Module № 1. Breed. Exterior. Interior. Constitution. Ontogenesis. Productivity													
Topic 1 Introduction. The concept of the subject. The doctrine of breed. Identification system in animal husbandry.	1	9	2		1		6						
Topic 2 Constitution, exterior, interior of agriculture animals.	2-3	12	2		2		8						
Topic 3 Individual development of agricultural animals.	3	15	2		1		12						
Topic 4 Agricultural animals' productivity	4-5	18	2		2		14						
In total by the module 1		51	8		6		40						
Module 2. Pedigrees. Tribal value. Selection and breeding methods. Inbreeding. Heterosis. Features of selection and breeding of animals													
Topic 1. Methods of agricultural animals' breeding. Breeding work in the herd.	7-8	18	2		2		12						
Topic 2. Breeding value of animals. The technique of compiling individual and group pedigrees.	9-10	16			4		14						
Topic 3. Theoretical and practical foundations of	11-12	20	2		4		10						

rejection and selection.													
Topic 4. Biological features and breeds of cattle and horses.	1 3- 1 4	8	2				8						
Topic 5. Biological features and breeds of poultry, pigs and sheep.	1 5	7	1				8						
In total by the module 2		69	7			9	50						
Total hours	-	120	15			15	90						
Educational practice _____ _____ _____ (if available in the working curriculum)		30											
			25	-	-		5		-	-	-		-
Total hours	-	150	40			15	95						

3. Topics of lectures

№ з/п	Name of topics	Amount of hours
1.	Introduction. The study of breed	2
2.	Constitution, conformation, and interior of farm animals	2
3.	Individual development of farm animals	1
4.	Productivity of farm animals	2
5.	Breeding methods of farm animals	2
6.	Theoretical and practical foundations of selection, selection and mating. Genotypic parameters of selection	2
7.	Biological characteristics and breeds of cattle and horses	2
8.	Biological characteristics and breeds of poultry, pigs, and sheep	2
	In total	15

4. Topics of laboratory classes

No	Name of topics	Amount of hours
1	Identification system in animal husbandry	1
2	Exterior of animals	1
3	Exterior assessment methods	1
4	Methods of accounting and estimation of animal growth	1
5	Accounting and evaluation of milk productivity	1
6	Accounting and evaluation meat productivity	1
7	Breeding methods. Crossing. Technique of drawing up crossing schemes	2
8	Estimation of breeding value of animals by origin	4
9	Inbreeding. Technique of estimation of inbreeding coefficient	3
	In total	30

5. Topics of independent work

No	Name of topics	Amount of hours
1.	Study of the identification system in animal husbandry	9
2.	Estimation of exterior of animals	9
3.	Determination of absolute, average daily and relative grows gain	8
4.	Milk productivity evaluation per lactation	2
5.	Meat productivity evaluation	2
6.	Evaluation of the productivity of various types of animals: pigs, sheep, poultry, horses	8
7.	Drawing up crossing schemes	10
8.	Construction of different types of pedigrees	12
9.	Estimation of inbreeding coefficient	12
10	Preparation of abstracts or presentations about breeds of cattle, horses, sheep, pigs.	16
	In total	90

6. Methods and Tools for Diagnosing Learning Outcomes

- Oral or written questioning;
- Testing;
- Presentation (defense) of laboratory work

7. Teaching Methods

- Practice-oriented learning;

- Flipped classroom;
- Inquiry-based learning;
- Teamwork.

8. Assessment of Learning Outcomes

The assessment of higher education students' knowledge is conducted on a 100-point scale and converted into national grades according to the current "Regulations on Exams and Credits at NUBiP of Ukraine."

8.1. Distribution of Points by Types of Learning Activities

Type of Learning Activity	Learning Outcomes	Assessment
Module 1. Conformation. Interior. Constitution. Breed. Ontogeny. Productivity		
Topic 1. Methods for Assessing Conformation and Constitution		
Laboratory work 1.	PLO 3, 7, 10. Students should know: <ul style="list-style-type: none"> • Basic concepts of constitution, conformation, and interior of animals, including their species-specific characteristics. • Methods for assessing conformation, constitution, and productivity of animals; criteria for selection, mating, and breeding. Students should be able to: <ul style="list-style-type: none"> • Assess the constitution, sex type, and conformation of farm animals according to standards. • Determine the production direction, breed, constitution type, and condition of animals based on their conformation. • Identify animals' susceptibility to diseases based on the 	5
Laboratory work 2.		5
Independent work		5

	evaluation of conformation and constitution.	
Topic 2. Methods for Recording and Studying the Growth and Development of Animals		
Laboratory work 3.	<p>After studying this topic, the student should know:</p> <ul style="list-style-type: none"> • Biological patterns of growth and development of farm animals at different age stages. • Factors influencing growth, development, and productivity of animals. • Basic methods for measuring, monitoring, and analyzing growth rates, live weight, morphological and physiological development indicators. • Modern technologies for recording animal growth in various branches of animal husbandry and their importance for veterinary practice and breeding work. <p>Students should be able to:</p> <ul style="list-style-type: none"> • Record and monitor growth and development indicators of animals at different age periods, considering species-specific characteristics. • Analyze collected data to assess animal health, productivity, and conformity to age and breed standards. • Identify deviations in growth rates and determine possible causes (pathological, genetic, technological). • Use growth study results to predict productivity and develop recommendations for 	5
Independent work		5

	<p>care, housing, and feeding of animals.</p> <ul style="list-style-type: none"> • Apply technical tools for collecting and analyzing information on animal growth and development. <p>PLO 3. Understand and explain biological processes regulating animal growth and development under normal and pathological conditions.</p> <p>PLO 7. Formulate conclusions about the effectiveness of animal rearing methods, justifying the choice of housing, feeding conditions, and preventive measures.</p> <p>PLO 10. Propose innovative approaches to studying animal growth and making veterinary decisions aimed at improving health and productivity.</p>	
Topic 3. Recording and Evaluation of Milk and Meat Productivity of Farm Animals		
Laboratory work 4.	After studying this topic, the student should know:	5
Laboratory work 5.		5
Independent work		5
	<ul style="list-style-type: none"> • Biological and physiological foundations of productivity formation in various species of farm animals. • Indicators used to evaluate milk and meat productivity. • Methods for recording productivity: milking trials, control milking, weighing, carcass measurements, etc. • The impact of feeding, housing, care conditions, and technological stress on animal productivity. • Breed characteristics and selection criteria related to milk and meat productivity. 	

	<p>Students should be able to:</p> <ul style="list-style-type: none"> • Record and comparatively evaluate animal productivity using quantitative and qualitative indicators (milk yield, fat and protein content; live weight gains, slaughter yield, etc.). • Determine production direction, type, and condition of animals based on evaluation results. • Interpret productivity records to assess health status, and effectiveness of feeding, care, and housing. • Formulate veterinary recommendations based on productivity analysis (identifying low-efficiency animals, selecting sires, etc.). • Use specialized instruments, record-keeping documents, and software for productivity monitoring. <p>PLO 3. Evaluate functional indicators of animals and physiological-biochemical processes underlying productivity, both under normal and pathological conditions.</p> <p>PLO 7. Draw conclusions about the effectiveness of feeding, housing, and organizational-technological measures based on productivity records.</p> <p>PLO 10. Propose optimal solutions to improve animal productivity through veterinary support, adjustment of housing conditions, and preventive work.</p>	
Modular Test 1		60
Total for Module 1		100
Module 2. Breeding Methods. Breeding Value. Selection and Mating.		

Breeding Methods. Inbreeding. Heterosis. Features of Animal Selection and Breeding		
Topic 1. Evaluation of the Breeding Value of Animals Based on Pedigree		
Laboratory work 1.	<p>After studying this topic, the student should know:</p> <ul style="list-style-type: none"> • Basic genetic concepts underlying heredity and variability in animals. • Patterns of trait inheritance from parents to offspring, including concepts of bloodline, inbreeding, and heterosis. • Methods of pedigree analysis and principles of maintaining breeding documentation. • Criteria and indicators for evaluating the breeding value of animals based on pedigree. • The impact of selective breeding on maintaining health, productivity, and viability of the herd. <p>Students should be able to:</p> <ul style="list-style-type: none"> • Analyze pedigrees and determine the degree of relatedness and inbreeding coefficient. • Assess the hereditary productivity and potential of animals based on pedigree results. • Calculate breeding value indices and interpret them for further selection or culling. • Identify valuable breeding animals based on genealogical data considering breeding goals. • Formulate veterinary and breeding conclusions regarding 	5
Laboratory work 2		5
Independent work		15

	<p>the suitability of animals for reproduction.</p> <ul style="list-style-type: none"> • Use information systems for working with breeding databases. <p>PLO 3. Understand the biological and genetic foundations of hereditary productivity, health, and disease resistance.</p> <p>PLO 7. Draw conclusions about the appropriateness of reproducing individual animals or lines based on pedigree evaluation and breeding documentation.</p> <p>PLO 10. Propose scientifically based decisions on selecting sires and the breeding use of animals, taking into account the genetic structure of the population and innovative breeding approaches.</p>	
<p>Topic 2. Establishing Kinship Relationships Among Animals and Determining the Degree of Inbreeding</p>		
<p>Laboratory work 3.</p>	<p>After studying this topic, the student should know:</p>	<p>5</p>
<p>Independent work</p>	<ul style="list-style-type: none"> • The basics of genealogical analysis in animal husbandry and veterinary science. • Concepts of kinship, lineage, family, blood relationship, inbreeding, and heterosis. • Classification of inbreeding according to the degree of closeness and its impact on animal health and viability. • Consequences of excessive inbreeding: decreased productivity, increased disease incidence, and impaired reproductive function. • Methods for calculating inbreeding coefficients and assessing genetic diversity in 	<p>10</p>

	<p>populations.</p> <p>Students should be able to:</p> <ul style="list-style-type: none"> • Collect, organize, and analyze data on animal pedigrees. • Establish kinship relationships among animals using breeding documentation and electronic databases. • Calculate the degree of inbreeding and analyze its potential consequences. • Determine the genetic value of an animal considering its pedigree and risks associated with close breeding. • Make selection and veterinary recommendations regarding the appropriateness of using animals in breeding programs. <p>PLO 3: Assess biological and genetic processes affecting animal viability and reproductive capacity.</p> <p>PLO 7: Formulate conclusions about the breeding and veterinary feasibility of mating based on kinship degree and inbreeding closeness.</p> <p>PLO 10: Use modern methods to evaluate relatedness and make informed decisions about mate selection, aiming to minimize inbreeding load in the population.</p>	
Modular Test 2		60
Total for Module 2		100
Coursework	$(M1 + M2)/2 * 0,7 \leq 70$	
Exam / credit	30	
Total for the course	$(\text{Coursework} + \text{exam}) \leq 100$	

8.2. Correlation between higher education rating and national grades

Rating of higher education seekers, points	National assessment for the results of compilation
	exams
90 – 100	Perfectly
74 – 89	Fine
60 – 73	Satisfactorily
0 – 59	Not satisfactorily

8.3. Assessment policy

Policy on deadlines and retakes	Assignments submitted after the deadline without a valid reason will receive a lower grade. Retaking modules is allowed only with the lecturer's permission and upon presentation of a valid reason (e.g., a medical certificate).
Academic integrity policy	Cheating during tests and exams is strictly prohibited (including the use of mobile devices). Term papers and essays must include proper textual citations of the sources used.
Attendance policy	Class attendance is mandatory. In case of valid reasons (e.g., illness, international internship), individual online learning may be arranged with the approval of the faculty dean.

9. Methodical support

1. A working curriculum for the discipline "Fundamentals of Animal Breeding" has been developed
2. Electronic training course "Fundamentals of Animal Breeding"<https://elearn.nubip.edu.ua/course/view.php?id=116> Автор курсу Супрун І.О.

10. Recommended sources

Basic literature

1. Мельник Ю.Ф. Практикум з розведення сільськогосподарських тварин / Ю.Ф. Мельник, К.А. Найденко, М.П. Журавель, А.В. Витриховська, М.М. Майборода, Т.В. Литвиненко. – К.: Видавничий Дім «Слово», 2007. – 240 с.

2. Розведення сільськогосподарських тварин / М.З. Басовський, В.П. Буркат, Д.Т. Вінничук та ін. – Біла Церква: БДАУ, 2001. – 400 с.
3. Супрун І.О. Основи розведення тварин: Робочий зошит. Методичні рекомендації для лабораторних і самостійних робіт студентів ОС «Магістр» за спеціальністю 211 «Ветеринарна медицина» / І.О. Супрун. – К.: НУБіП України, 2024. – 158 с.
4. Хмельничий Л.М., Супрун І.О. Основи розведення тварин / Л.М. Хмельничий, І.О. Супрун. – К.: НУБіП України, 2024. – 342 с.

Supporting literature

1. Зубець М.В., Хмельничий Л.М., Бащенко М.І., Найденко К.А., Витрихівська А.В. Лінійна оцінка екстер'єру молочних корів. – К.: НАУ, 2000.
2. Іовенко В.М. Вівчарство України. – К.: Аграрна наука, 2017.
3. Каталог жеребців-плідників, допущених до племінного використання / П.І. Вербицький, О.В. Білоус, О.О. Новіков, Д.А. Волков, І.В. Ткачова, О.М. Латка, О.В. Бондаренко, С.В. Лютих, О.О. Губін, Т.Є. Ільницька, Н.В. Зуєва, Б.М. Гопка, Л.Ю. Безугла, В.Д. Марущак; за ред. І.В. Ткачової. – 2007. – 55 с.
4. Ладика В.І., Жукорський О.М., Грициняк І.І., Козир В.С., Катеринич О.О., Церенюк О.М., Хмельничий Л.М., Рєзнікова Н.Л. Генетичні ресурси вітчизняних порід сільськогосподарських тварин: монографія. – Одеса: Олді+, 2023. – 336 с.
5. Найденко К.А., Журавель М.П., Витрихівська А.В., Тимченко О.Г. Родоводи с.-г. тварин. – К.: НАУ, 1998.
6. Рибалко З.П., Буркат В.П., Березовський М.Д. Генофонд, оцінка та використання свиней. – К.: Асоціація «Україна», 1994.
7. Рубан С.Ю., Даншин В.О., Мітіогло Л.В., Литвиненко Т.В., Сидоренко О.В., Свириденко Н.П. Генетичні ресурси тваринництва. – К., 2022. – 611 с.
8. Супрун І.О. Методичні рекомендації "Основи розведення сільськогосподарських тварин. Тестові завдання". – К.: Компрінт, 2014.
9. Супрун І.О. Методичні рекомендації з дисципліни "Розведення с.-г. тварин" "Poultry breeding": Методичні вказівки до виконання лабораторних та самостійних робіт студентами ОКР «Бакалавр» спеціальності 6.110100 «Ветеринарна медицина». – К.: Компрінт, 2015.
10. Тимченко О.Г., Витрихівська А.В., Найденко К.А. Молочна продуктивність с.-г. тварин. – К., 1998.
11. Хмельничий Л.М., Супрун І.О. Основи генетики та селекції сільськогосподарських тварин. – Аграрна освіта, 2011. – 440 с. – (3 грифом Міністерства агропромислової політики і продовольства, лист № 18-1-28/812 від 09.07.2011 р.).
12. Suprun I. Estimation of agricultural animals productivity. – К.: Центр інформаційних технологій, 2009. – 33 с.
13. Suprun I. Estimation of agricultural animals exterior. – К.: Центр інформаційних технологій, 2009. – 51 с.

Information sources

http://agriculture-growing-animal-feed.blogspot.com/2015/04/blog-post_93.html

<http://www.konevodstvo.org/>

http://www.aphis.usda.gov/animal_health/birdbiosecurity/

<http://avm-ua.org>

<http://asu.pigua.info>

<http://www.eaap.org>

<http://www.icar.org>

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