

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

Department of Dairy and Beef Production Technology  
Department of Occupational Safety and Biotechnical Systems in Animal Husbandry

**“APPROVED”**

Faculty of Agrarian Management

“        ” \_\_\_\_\_ 2025

**CURRICULUM OF ACADEMIC DISCIPLINE  
TECHNOLOGIES IN ANIMAL FARMING**

Area of knowledge D “Business, Administration and Law”

Specialty D3 “Management”

Educational program International Business Management

Faculty of Agrarian Management

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## Description of the discipline

### TECHNOLOGIES IN LIVESTOCK FARMING

Discipline is focused on the application of modern technologies to enhance the efficiency, sustainability, and welfare of livestock systems. It encompasses innovations in breeding, nutrition, housing, disease control, and reproductive management, aiming to improve productivity while minimizing environmental impact. This field integrates biotechnology, automation, data analysis, and precision farming tools to optimize animal health and farm operations. Emphasis is also placed on animal welfare standards and sustainable resource use, making it essential for meeting global demands for animal products responsibly.

Area of knowledge, specialty, educational program, academic degree		
Academic degree	Bachelor's	
Specialty	D3 “Management”	
Educational program	International Business Management	
Characteristics of the discipline		
Type	compulsory	
Total number of hours	120	
Number of ECTS credits	4	
Number of modules	4	
Course project (work) (if any)	–	
Form of assessment	exam	
Indicators of the discipline for full-time and part-time forms of university study		
	Full-time	Part-time
Year of study	1	-
Semester	1	-
Lectures	30 hours	-
Practical classes and seminars	30 hours	-
Laboratory classes	–	-
Self-study	60 hours	-
Number of hours per week for full-time students	4 hours	-

## **1. Aim, objectives, competences and expected learning outcomes of the discipline**

The **main aim** of this discipline is to equip students with the knowledge and skills needed for the rational selection and effective use of various technological elements. These elements are intended to increase animal productivity, lower production costs, and improve the competitiveness of agricultural products. The **main objectives** include developing practical skills for producing sustainable animal products. This necessitates the widespread adoption of variety-based, intensive, energy- and resource-efficient, and environmentally sustainable technologies. Additionally, it involves aligning the production of different farm animal species with market demands.

### ***Competences acquired:***

**Integral competency (IC):** The ability to solve complex specialized tasks and practical problems characterized by complexity and uncertainty in the field of management or in the learning process, which involves the application of theories and methods of social and behavioral sciences.

### **General competencies (GC):**

GC4. Ability to abstract thinking, analysis, synthesis

### **Special (professional) competencies (SC):**

SC 1. Ability to identify and describe the characteristics of an organization.

SC 2. Ability to analyze the results of the organization's activities, compare them with the factors of influence of the external and internal environment.

SC 6. Ability to act in a socially responsible and conscious way.

SC 10. Ability to evaluate the work performed, ensure its quality and motivate the staff of the organization.

SC 12. Ability to analyze and structure organizational problems and formulate justified solutions.

### **Expected Learning Outcomes (ELO):**

ELO 4. Demonstrate skills in identifying problems and justifying management decisions.

ELO 5. Describe the content of the functional areas of an organization

ELO 6. Demonstrate skills in searching for, collecting and analyzing information, calculating indicators to justify management decisions.

ELO 12. Evaluate the legal, social and economic implications of the organization's operations.

ELO 20. Carry out commercial activities in foreign markets, taking into account the specifics of legal regulation.

## 2. Program and structure of the discipline

Names of content modules and topics	Number of hours								
	Full-time form					Part-time form			
	weeks	total	including			total	including		
			l	p	self		l	p	self
1	2	3	4	5	6	7	8	9	10
<b>Module 1. Basics of breeding feeding and keeping of farmed animals</b>									
Topic 1. Basics of farm animals breeding	1-2	9	3	3	3				
Topic 2. General of animal nutrition and assessment of nutritional value of feedstuffs	2-3	9	3	3	3				
Topic 3. Feedstuffs, their classification, and usage in feeding farm animals	4	7	2	2	3				
<b>Sum of module 1</b>		<b>25</b>	<b>8</b>	<b>8</b>	<b>9</b>				
<b>Module 2. Livestock Production Technologies</b>									
Topic 4. Production technology for dairy and beef cattle	5	7	2	2	3				
Topic 5. Digital farming and farms profitability.	6	7	2	2	3				
Topic 6. Swine production	7	7	2	2	3				
Topic 7. Poultry production	8	7	2	2	3				
Topic 8. Beekeeping production	9	7	2	2	3				
<b>Sum of module 2</b>		<b>35</b>	<b>10</b>	<b>10</b>	<b>15</b>				
<b>Module 3: Mechanization of Livestock Production</b>									
Topic 9. Fundamentals of livestock mechanization. Equipment for keeping and caring of animals	10	6	2	2	2				
Topic 10. Mechanization of loading, preparation and distribution of feed	11	8	2	2	4				
Topic 11. Mechanization of water supply and animal watering, manure cleaning and utilization.	12	8	2	2	4				
Topic 12. Mechanization of obtaining of animal products	13	8	2	2	4				
<b>Sum of module 3</b>		<b>30</b>	<b>8</b>	<b>8</b>	<b>14</b>				
<b>Module 4. Occupational safety in Livestock Farming</b>									
Topic 13. Basics of occupational safety and health.	14	14	2	2	10				
Topic 14. Basic safety and hygiene requirements in animal husbandry	15	16	2	2	12				
<b>Sum of module 4</b>		<b>30</b>	<b>4</b>	<b>4</b>	<b>22</b>				
<b>УСЬОГО ГОДИН</b>		<b>120</b>	<b>30</b>	<b>30</b>	<b>60</b>				

### 3. Topics of lectures

№	Topic title	Number of hours
Content module 1		
1	Basics of farm animals breeding.	3
2	General of animal nutrition and assessment of nutritional value of feedstuffs.	3
3	Feedstuffs, their classification, and usage in feeding farm animals.	2
4	Production technology for dairy and beef cattle.	2
5	Digital farming and farms profitability.	2
6	Swine production.	2
7	Poultry production.	2
8	Beekeeping production.	2
9	Fundamentals of livestock mechanization. Equipment for keeping and caring of animals	2
10	Mechanization of loading, preparation and distribution of feed	2
11	Mechanization of water supply and animal watering, manure cleaning and utilization.	2
12	Mechanization of obtaining of animal products	2
13	Basics of occupational safety and health.	2
14	Basic safety and hygiene requirements in animal husbandry	2
	<b>Sum</b>	<b>30</b>

### 4. Topics of practical classes

№	Topic title	Number of hours
Content module 1		
1	Livestock identification methods. Legislative bases. Identification and traceability issues	3
2	Evaluation of farm animals for exterior and growth	3
3	Evaluation of nutritional value of feedstuffs by the amount of digestible nutrients	2
4	Determining net energy feedstuffs	2
5	Calculation of the technological process of milk production	2
6	Estimating farm economical values for milk production and marketing	2
7	Calculation of the technological process of swine production	2
8	Standards for basic types of agricultural products	2
9	Equipment for animals keeping and microclimate creation	2
10	Machines for feed preparation and distribution	2
11	Equipment for watering systems and manure cleaning	2
12	Milking and shearing machines	2
13	Documentation on occupational safety	2
14	Determination of dangerous production factors	2
	<b>Sum</b>	<b>30</b>

### 5. Topics for self-study

№	Topic title	Number of hours
1	Organization of breeding work in livestock	2
2	Technology of growing replacing heifers in the post-milk period.	2
3	The structure and function of the breast. The composition of milk of the main species of farm animals	4
4	Technology of production, processing and sale of milk. Primary and secondary processing of milk.	4

5	Ways to increase the milk productivity of farm animals and economic efficiency of milk production.	2
6	Cattle breeds of meat productivity - Ukrainian meat, Volyn meat and their types, Hereford, Aberdeen-Angus.	2
7	Technology of fattening pigs for meat, bacon and fatty conditions	4
8	Technology of pork production in specialized farms	4
9	Digitalization of farm animal breeding	4
10	Sheep products (wool, smushki, sheepskin, meat, milk)	4
11	Economic importance and economic and biological characteristics of goats	2
12	Companion animals	2
13	Farm general planning	4
14	Equipment for animal caring	4
15	Equipment for waste utilization	4
16	Robotics systems in livestock	4
17	Basics of electrical safety at livestock enterprises	4
18	Basics of fire safety on livestock farms	4
	<b>Sum</b>	<b>60</b>

### 6. Methods for assessing expected learning outcomes:

- exam;
- module tests;
- essays;
- calculation and calculation-graphic works;
- defend of tasks;

### 7. Teaching methods.

Methods of organization and implementation of teaching and learning of students who used to study subjects:

in terms of transmission and perception of educational information:

- a. verbal (lecture);
- b. visual (illustration, demonstration);
- c. practical (practical or laboratory work);

in terms of logic and thinking:

- d. explanatory, illustrative (presentation);
- e. reproductive (short test papers);

in terms of management training:

- f. job training under the supervision of a teacher;
- g. independent work;

in terms of a team:

- h. incentives (extra points for abstracts);

aspect of self-employment:

- i. Training Module: structural logic scheme;
- j. sample tests

## 8. Results assessment.

The student's knowledge is assessed by means of a 100-point scale converted into the national grades according to current "Exam and Credit Regulations at NULES of Ukraine"

### 8.1. Distribution of points by types of educational activities

Educational activity	Results	Assessment
Module 1. Basics of breeding feeding and keeping of farmed animals		
Topic 1. Basics of farm animals breeding.		
Practical work 1.	<b>ELO 4, The student must: <i>Know</i></b> the basics of animal genetics, breeding and biotechnology. <b><i>Understand</i></b> the essence of animal breeding methods, exterior and productive qualities of animals of different productivity areas	<b>20</b>
Topic 2. General of animal nutrition and assessment of nutritional value of feedstuffs		
Practical work 2.	<b>ELO 6, The student must: <i>Know</i></b> the basics of animal nutrition and feed nutritional assessment. <b><i>Understand</i></b> methodological approaches to determining the energy content of feed.	<b>20</b>
Topic 3. Feedstuffs, their classification, and usage in feeding farm animals		
Practical work 3.	<b>ELO 6, The student must: <i>Know</i></b> the concept of feed, its classification. And technologies for the preparation, storage and use of feed. <b><i>Understand</i></b> the essence of preservation in the preparation of silage and haylage.	<b>20</b>
Self-study 1	<b>ELO 6. ELO 20. The student should</b> independently learn to use sources to search for information, including various different databases	<b>20</b>
Test M1		<b>20</b>
<b>Total M1</b>		<b>100</b>
Module 2. Basics of breeding feeding and keeping of farmed animals		
Topic 4. Production technology for dairy and beef cattle.		
Practical work 4	<b>ELO 5, The student must: <i>Know</i></b> the essence of milk and beef production technology.	<b>12</b>
Topic 5. Digital farming and farms profitability.		
Practical work 5	<b>ELO 5, The student must: <i>Know</i></b> the methodological approach to calculating the economic efficiency of milk production. <b><i>Analyze</i></b> the results and use them skilfully in practice.	<b>12</b>
Topic 6. Swine production.		
Practical work 6	<b>ELO 5, ELO 6, The student must: <i>Know</i></b> the technology of pork production in large pig farms and small private enterprises.	<b>12</b>
Topic 7. Poultry production.		
Practical work 7	<b>ELO 5, ELO 6, The student must: <i>Know</i></b> the technology of poultry production in poultry farms and small private enterprises. <b><i>Understand</i></b> the peculiarities of poultry rearing and production of eggs or poultry meat	<b>12</b>
Topic 8. Beekeeping production.		
Practical work 8	<b>ELO 12, The student must: <i>Know</i></b> the technology of beekeeping products production. <b><i>Understand</i></b> the peculiarities of the production of various bee products and preventive measures in beekeeping.	<b>12</b>
Self-study 2	<b>ELO 6. The student should</b> independently learn to use sources to search for information, including various different databases	<b>20</b>
Test M2		<b>20</b>
<b>Total M2</b>		<b>100</b>
Module 3. Mechanization of Livestock Production		
Topic 9. Fundamentals of livestock mechanization. Equipment for keeping and caring of animals.		
Practical work 9	<b>ELO 5, The student must: <i>Know</i></b> the essence of livestock mechanization, technologies and examples of equipment for keeping and caring of animals	<b>15</b>
Topic 10. Mechanization of loading, preparation and distribution of feed.		

Practical work 10	<b>ELO 5, The student must: <i>Know</i></b> technologies and examples of equipment for loading, preparation and distribution of feed.	<b>15</b>
Topic 11. <b>Mechanization of water supply and animal watering, manure cleaning and utilization.</b>		
Practical work 11	<b>ELO 5, ELO 6, The student must: <i>Know</i></b> technologies and examples of equipment for water supply and animal watering, manure cleaning and utilization.	<b>15</b>
Topic 12. <b>Mechanization of obtaining of animal products.</b>		
Practical work 12	<b>ELO 5, ELO 6, The student must: <i>Know</i></b> technologies and examples of equipment for milking, shearing, obtaining other animal products.	<b>15</b>
Self-study 3	<b>ELO 12. The student should</b> independently learn to use sources to search for information, including various different databases	<b>20</b>
Test M3		<b>20</b>
<b>Total M3</b>		<b>100</b>
Module 4. <b>Occupational safety in Livestock Farming</b>		
Topic 13. <b>Basics of occupational safety and health.</b>		
Practical work 13	<b>ELO 5, The student must: <i>Know</i></b> the essence of occupational safety and health in livestock farming.	<b>20</b>
Topic 14. <b>Basic safety and hygiene requirements in animal husbandry.</b>		
Practical work 14	<b>ELO 5, The student must: <i>Know</i></b> the technologies and means of safe work in animal husbandry.	<b>20</b>
Self-study 4	<b>ELO 6. The student should</b> independently learn to use sources to search for information, including various different databases	<b>40</b>
Test M4		<b>20</b>
<b>Total M4</b>		<b>100</b>
<b>Class work</b>	<b><math>(M1+M2+M3+M4)/4 \cdot 0,7 \leq 70</math></b>	
<b>Exam</b>	<b>30</b>	
<b>Total for course</b>	<b><math>(\text{Class work} + \text{exam}) \leq 100</math></b>	

## 8.2. Scale for assessing student's knowledge

Student's rating, points	National grading (exam/credits)
90-100	excellent
74-89	good
60-73	satisfactory
0-59	unsatisfactory

## 8.3. Assessment policy

<b><i>Deadlines and exam retaking rules</i></b>	<b>EXAMPLE:</b> works that are submitted late without valid reasons will be assessed with a lower grade. Module tests may be retaken with the permission of the lecturer if there are valid reasons (e.g. a sick leave).
<b><i>Academic integrity rules</i></b>	<b>EXAMPLE:</b> cheating during tests and exams is prohibited (including using mobile devices). Term papers and essays must have correct references to the literature used
<b><i>Attendance rules</i></b>	<b>EXAMPLE:</b> Attendance is compulsory. For good reasons (e.g. illness, international internship), training can take place individually (online by the faculty dean's consent)

## 9. Educational and methodological support

1. Electronic course of the discipline "Systems of Technologies: Livestock Farming" on the educational portal of NULES of Ukraine eLearn. URL: <https://elearn.nubip.edu.ua/course/view.php?id=369>.



2. Technology of Animal Products Production. The Practical guide for laboratory classes for the students of economical majors (for group with intensive English learning). – 2017.

3. V. Khmelovskiy, V. Bratishko, O. Achkevych, V. Rebenko, O. Zabolotko, S. Potapova, V. Achkevych, O. Solomka Machinery and equipment for livestock / Textbook. – Kyiv. NULES, 2022, 229 p.

4. Rebenko V.I., Achkevych O.M., Potapova S.E. Methodical instructions for seminars in the discipline "Systems of Technologies: Livestock Farming" (Farm mechanization, Labor safety) for applicants for the first (bachelor's) level of education in the specialty 073 'Management', educational program "Management". - Kyiv: NULES of Ukraine. 2025. 48 с.

5. Шуле Г., Пфафф С., Ващенко П., Лавріненко І., Мазур Н., Гетя А., Кононенко Р., Матвеев М., Якубець Т., Пархоменко Л., Стрижак Т., Дудник Т., Дудус Т., Гетя О., Степура Л. Стале тваринництво та благополуччя тварин. Модуль 3 цифрове тваринництво. Електронний посібник. К.: «НМЦ ВФПО Агроосвіта», 2024.

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## **10. Recommended sources of information**

1. Костенко В. І. Технологія виробництва молока і яловичини : підручник. К.: «Ліра», 2023. 443 с.

2. Технологія виробництва і переробки продукції свинарства : навчальний посібник / М. Повод, О. Бондарська, В. Лихач, С. Жижка, В. Нечмілов та ін. – Київ : Науково-методичний центр ВФПО, 2021. – 360 с.

3. Угнівенко А.М., Колісник О.І., Кос Н.В. М'ясне скотарство. підручник. К.: «ЦП Компрінт», 2020. 536 с.

4. Угнівенко, А.М., Колісник, О.І., Антонюк, Т.А., Носевич, Д.К., Кос, Н.В. Виробництво екологічно безпечної продукції скотарства: підручник. К.: «ЦП Компрінт», 2022. 480 с.

5. Blair, R. (2021). Nutrition and feeding of organic cattle. Cabi. Nutrition and feeding of organic cattle (2-ге вид.). <https://doi.org/10.1079/9781789245554.0000>

6. Campbell, E. (2021). Livestock Farming. Murphy & Moore Publishing. 100 p.

7. Lovarelli, D., Bacenetti, J., & Guarino, M. (2020). A review on dairy cattle farming: Is precision livestock farming the compromise for an environmental, economic and social sustainable production? Journal of Cleaner Production, 262, 121409.

8. Mahmud, M. S., Zahid, A., Das, A. K., Muzammil, M., & Khan, M. U. (2021). A systematic literature review on deep learning applications for precision cattle farming. Computers and Electronics in Agriculture, 187, 106313. <https://doi.org/10.1016/j.compag.2021.106313>

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10. National Academies of Sciences, Engineering, and Medicine; Division on Earth and Life Studies; Board on Agriculture and Natural Resources; Committee on Nutrient Requirements of Dairy Cattle. (2021). Nutrient Requirements of Dairy Cattle: Eighth Revised Edition. National Academies Press (US).

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13. Webster, J., & Margerison, J. (Eds.). (2022). Management and welfare of farm animals: the UFAW farm handbook. John Wiley & Sons.
14. Повозніков М.Г., Решетник А.О. Утримання та гігієна свиней: навчальний посібник. Кам'янець-Подільський: Видавець ПП «Зволейко ДГ», 2017. 272 с.
15. Теорія і практика нормованої годівлі великої рогатої худоби / за ред. В. М. Кандиби, І. І. Ібатулліна, В. І. Костенка. Житомир: ПП «Рута», 2012. 860 с.
16. Костенко В.І. Технологія виробництва молока і яловичини. Київ: Ліра-К, 2020. 672 с.
17. Про племінну справу: Закон України від 26.10.2023 № 3691-ХІІ. URL: <https://zakon.rada.gov.ua/laws/show/3691-12>
18. Ревенко І.І., Хмельовський В.С., Заболотько О.О., Потапова С.Є. та ін. Машина і обладнання для тваринництва. Електронний підручник. Науково-методичний центр вищої та фахової передвищої освіти, 2021. URL: <https://nmcbook.com.ua/elepidruchnuk/motnmc/Golovna/Golovna.htm>
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21. Про охорону праці: Закон України від 14.10.1992 № 2694-ХІІ, із змінами та доповненнями. URL: <https://zakon.rada.gov.ua/go/2694-12>
22. НПАОП 0.00-4.21-04 «Типове положення про службу охорони праці на підприємстві». Затверджене Наказом Держнаглядохоронпраці від 15.11.2004 р. № 255.
23. НПАОП 0.00-4.09-07 «Типове положення про комісію з питань охорони праці підприємства». Затверджене Наказом Держгірпромнагляду від 21.03.2007 р. № 55.
24. НПАОП 0.00-4.12-05 «Типове положення про порядок проведення навчання і перевірки знань з питань охорони праці». Затверджене Наказом Держнаглядохоронпраці від 26.01.2005 р. № 2.
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26. Корець Л.І. Електронний посібник з дисципліни: "Машина і обладнання для тваринництва" ЛТК ЛНТУ.
27. URL: <http://lib.lntu.info/book/liubeshiv/liubeshiv/2014/14-06/>
28. Про загальнообов'язкове державне соціальне страхування: Закон України від 23.09.1999 № 1105-ХІV URL: <https://zakon.rada.gov.ua/go/1105-14>
29. Міжнародна організація праці (МОП). URL: <https://www.ilo.org/global/lang-en/index.htm>