NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCES OF UKRAINE

Department of Plant Science

Department of Agricultural Machines and System Technologies named after Academician P.M. Vasylenko

APPROVED
Faculty of Agricultural Management
"05" June 2025

CURRICULUM OF ACADEMIC DISCIPLINE

TECHNOLOGIES OF CROP PRODUCTION

Area of knowledge **D "Management, Administration and Law"**
Specialty **D5 "Marketing"**
Academic programme **Marketing**
Faculty **Agrarian management**

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Description of the discipline. The main goal of the discipline is to provide knowledge on creating optimal technological (agroecological) conditions for producing the required amount of high-quality plant products based on intensive photosynthesis in field crops while maintaining or increasing soil fertility. The main task is to acquire practical skills in producing high-quality, environmentally friendly products with minimal energy and labor costs while maximizing their output per unit of time and per unit of land, which requires the wide implementation of varietal, intensive, energy- and resource-saving, and ecologically appropriate technologies. Theoretical foundations of labor protection, legal foundations of labor protection for workers in crop production, safety techniques in crop production, and fire safety in crop production are covered in the course.

Area of knowledge, specialty, academic programme, academic degree				
Academic degree	*Bachelor*			
Specialty	*D5 "Marketing"*			
Academic programme	*Marketing*			
Characteristics of the discipline				
Type	Core			
Total number of hours	120			
Number of ECTS credits	4			
Number of modules	3			
Course project (work) (if any)				
Form of assessment	*Exam*			
Indicators of the discipline for full-time and part-time forms of university study				
	University study			
	Full-time		**Part-time**	
Year of study	1		1	
Term	1		1	
Lectures	*30*	*hours*	*6*	*hours*
Practical classes and seminars	*30*	*hours*	*4*	*hours*
Laboratory classes		*hours*		*hours*
Self-study	*60*	*hours*	*110*	*hours*
Number of hours per week for full-time students	*4*	*hours*		

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

Aim is to provide knowledge on creating optimal technological (agroecological) conditions for the production of the necessary amount of high-quality plant products based on intensive photosynthesis in field crops while maintaining or increasing soil fertility.

Competences acquired:

Integral competence (IC): The ability to solve complex specialized tasks and practical problems in the field of marketing or during the learning process, which involves the application of relevant theories and methods and is characterized by complexity and uncertainty of conditions.

General competence (GC):_

GC1. Ability to exercise one's rights and responsibilities as a member of society, to be aware of the values of a civil (free democratic) society and the need for its sustainable development, the rule of law, human and civil rights and freedoms in Ukraine.

GC2. Ability to preserve and enhance moral, cultural, and scientific values and achievements of society based on the understanding of history and regularities of the development of the subject area, its place in the general system of knowledge about nature and society, and in the development of society, technology, and engineering; to use various types and forms of physical activity for active recreation and leading a healthy lifestyle.
GC4. Ability to learn and master modern knowledge.
GC6. Knowledge and understanding of the subject area and understanding of professional activity.
GC7. Ability to apply knowledge in practical situations.
GC14. Ability to act socially responsibly and consciously.
Special (professional) competence (SC):
SC4. Ability to carry out marketing activities based on an understanding of the essence and content of marketing theory and the functional relationships among its components.
SC5. Ability to correctly apply marketing methods, techniques, and tools.
SC14. Ability to propose improvements to the functions of marketing activities.
Expected learning outcomes (ELO):
ELO 12. Demonstrate skills in independent work, flexible thinking, openness to new knowledge, and the ability to be critical and self-critical.
ELO 16. Meet the requirements set for a modern marketer and improve the level of personal professional training.
ELO 19. Demonstrate skills in developing a company's marketing policy; apply modern methods, concepts, and tools of product policy, pricing, distribution, communications, consumer behavior research, and target audience formation to determine the development prospects of market participants.

2. Programme and structure of the discipline

Modules and topics	**Number of hours**												
	full-time							**part-time**					
	weeks	total	including					total	including				
			l	p	lab	ind.	s.st.		l	p	lab	ind.	s.st.
Module 1. ***. Features and Prospects of Using Marketing Tools in Crop Production.***													
Topic 1. General Overview of the Crop Production Market in Ukraine. Crop Production as a Science and Agricultural Sector.		6	2		2		2	5	1				4
Topic 2. Grain and the Grain Market in Ukraine and Worldwide. Products of the Grain Sector.		8	2		2		4	7	1				6
Topic 3. Marketing Approaches to Winter Wheat Cultivation.		8	2		2		4	10	2				8
Topic 4. Early and Late Spring Cereal Crops – The Foundation of Ukraine’s Grain Market.		8	2		2		4	8					8
Topic 5. The Legume Market: Development, Trends, and Forecasts. Marketing Approaches in		8	2		2		4	8					8

Pea and Soybean Cultivation Technologies.													
Total for module 1	**38**		**10**		**10**		**18**	**38**	**4**				**34**
Module 2. ***Organization of cultivation of industrial crops (raw materials) for processing industry.***													
Topic 6. The Tuber Crop Market. General Characteristics and Specific Features of Using Marketing Tools in Their Cultivation Technologies.		8	2	-	2	-	4	6					6
Topic 7. Root Crops. Sugar Beet as the Main Raw Material for Sugar Production in Ukraine.		8	2	-	2	-	4	8		2			6
Topic 8. The Role of Oilseed Crops in the Market of Ukraine and Worldwide.		8	2	-	2	-	4	10					10
Topic 9. Sunflower and Rapeseed – Major Oilseed Crops in Ukraine and Globally. Key Factors Influencing Cultivation.		10	2	-	2	-	6	10					10
Total for module 2	**34**		**8**		**8**		**18**	**34**		**2**			**32**
Module 3. ***Mechanization in crop production. Theoretical basis of Labor protection***													
Topic 10. General issues of the discipline. Tractors and cars. Machines for tillage, fertilization and planting of crops.		8	2		2		4	8	2				6
Topic 11. Machines for plant protection, green harvesting and harvesting of cereal crops		8	2		2		4	8		2			6
Topic 12. Machines for post-harvest processing of cereals, harvesting corn and potatoes		6	2		2		2	6					6
Topic 13. Machines for harvesting root crops of beets, flax, vegetables and fruit and berry crops.		9	2		2		5	6					6
Topic 14. Organization of Labor Protection in Crop Production		9	2		2		5	8					8
Topic 15. Labor Protection when Working with Mechanisms								10					10
Total for module 3	**48**		**12**		**12**		**24**	48	2	2			42
Course project (work) _____ **(if included in the curriculum)**													
Total hours	**150**		**30**		**30**		**60**	**120**	**6**	**6**			**108**

3. **Topics of lectures**

No.	Topic	Hours
1	General Overview of the Crop Production Market in Ukraine. Crop Production as a Science and Agricultural Sector..	2
2	Market in Ukraine and Worldwide. Products of the Grain Sector.	2
3	Marketing Approaches to Winter Wheat Cultivation.	2
4	Early and Late Spring Cereal Crops – The Foundation of Ukraine's Grain Market.	2
5	The Legume Market: Development, Trends, and Forecasts. Marketing Approaches in Pea and Soybean Cultivation Technologies.	2
6	The Tuber Crop Market. General Characteristics and Features of Using Marketing Tools in Their Cultivation Technologies.	2
7	Root Crops. Sugar Beet as the Main Raw Material for Sugar Production in Ukraine.	2
8	The Role of Oilseed Crops in the Market of Ukraine and Worldwide.	2
9	Sunflower and Rapeseed – Major Oilseed Crops in Ukraine and Globally. Key Factors Influencing Successful Cultivation.	2
10	Tractors and Automobiles. Machinery for Soil Tillage, Fertilizer Application, and Crop Sowing.	2
11	Machinery for Plant Protection, Green Mass Harvesting, and Cereal Crop Harvesting.	2
12	Machinery for Post-Harvest Grain Processing, Corn and Potato Harvesting.	2
13	Machinery for Harvesting Root Crops such as Sugar Beet, Flax, Vegetables, and Fruit and Berry Crops.	2
14	Organization of Occupational Safety in Crop Production.	2
15	Occupational Safety When Working with Machinery.	2
Total hours		30

4. **Topic of laboratory (practical, seminars) classes**

No.	Topic	Hours
1	General characteristics of cereal crops.	2
2	Characteristics of crops and their growth phases	2
3	Botanical and morphological characteristics of wheat.	2
4	Morphological structure of corn.	2
5	Legume crops. Features of growth and development.	2
6	Potatoes. Botanical characteristics.	2
7	General characteristics of root vegetables.	2
8	Characteristics of representatives of the oil crop group.	2
9	Sunflower. Morphological structure.	2
10	Ensuring Working Conditions in Enclosed Spaces	2
11	General issues of the discipline. Tractors and cars. Machines for tillage, fertilization and planting of crops.	2
12	Machines for plant protection, fodder and harvesting of cereals	2
13	Machines for post-harvest processing of cereals, harvesting corn and potatoes	2
14	Machines for harvesting root crops of beets, flax, vegetables and fruit and berry crops	2
15	Ensuring Safe Working Conditions in the Field	2
Total hours		30

5. **Topics of self-study**

No.	Topic	Hours
1	Spring barley: biological features, cultivation technology.	6
2	Buckwheat: significance, biological features, cultivation technology.	6
3	Lentils: significance, biological features, cultivation technology.	4
4	Chickpeas: significance, biological features, cultivation technology.	4
5	Oil crops of the Brassicaceae family.	6
6	Essential oil crops.	5
7	Fiber crops.	5
8	Setting up a machine for tillage, fertilizing and planting of crops.	14
9	Labor protection documentation	10
Total hours		60

6. Methods of assessing expected learning outcomes:

– oral or written survey;
– interview;
– test;

7. **Teaching methods *(select necessary or add):***

– problem-based method;
– practice oriented studying method;
– case method;
– research based method;
– learning discussions and debates method;

8. Results assessment.

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

8.1. Distribution of points by types of educational activities

Educational activity	**Results**	**Assessment**
Module 1. **Management of the production process of cultivation technologies of cereals**		
Practical work 1. General characteristics of cereal crops.	ELO 12, 16, 19. Marketing students gain essential agronomic knowledge, learning the biological and morphological traits of key cereal and legume crops such as wheat, maize, peas, and soybeans. They understand crop development stages and classification features, which enhances their ability to analyze agricultural products. This knowledge supports critical evaluation of market segments, product positioning, and consumer targeting in the agri-food sector, strengthening their independence, adaptability, and decision-making skills.	**11**
Practical work 2. Characteristics of crops and their growth phases		**11**
Practical work 3. Botanical and morphological characteristics of wheat.		**11**
Practical work 4. Morphological structure of corn.		**11**
Practical work 5. Legume crops. Features of growth and development.		**11**
Self-study 1.		**15**
Module control work 1.		**30**
Total for module 1		**100**

Module 2. **Organization of cultivation of industrial crops (raw materials) for processing industry.**		
Practical work 6. Potatoes. Botanical characteristics.	ELO 12, 16, 19. Students explore the biological and economic characteristics of tuber, root, and oilseed crops, including potatoes, beets, and sunflower. They learn to assess oil quality, classify crops by morphological traits, and plan harvest timing and processing costs. This agronomic foundation equips future marketers with the ability to evaluate product quality and cost-effectiveness, essential for developing competitive marketing strategies in the agricultural and food industries.	**15**
Practical work 7. General characteristics of root vegetables.		**15**
Practical work 8. Characteristics of representatives of the oil crop group.		**15**
Practical work 9. Sunflower. Morphological structure.		**15**
Self-study 2.		**10**
Module control work 2.		**30**
Total for module 2		**100**
Module 3. **Mechanization in crop production. Theoretical basis of Labor protection**		
Practical work 10. General issues of the discipline. Tractors and cars. Machines for tillage, fertilization and planting of crops.	ELO 12, 16, 19. Students acquire practical knowledge of agricultural machinery used across the production chain—from sowing to harvesting and post-harvest processing. They also learn about workplace safety, microclimate control, and emergency response. These skills enhance their understanding of production logistics and cost structures, enabling them to make informed marketing decisions, assess operational risks, and communicate effectively with technical teams in agribusiness environments.	**10**
Practical work 11. Machines for plant protection, green harvesting and harvesting of cereal crops		**10**
Practical work 12. Machines for post-harvest processing of cereals, harvesting corn and potatoes		**10**
Practical work 13. Machines for harvesting root crops of beets, flax, vegetables and fruit and berry crops		**10**
Practical work 14. Ensuring Working Conditions in Enclosed Spaces		**10**
Practical work 15. Ensuring Safe Working Conditions in the Field		**10**
Self-study 2.		**10**
Module control work 2.		**30**
Total for module 2		**100**
Class work		**(M1 + M2 + M3)/3*0,7 ≤ 70**
Exam/credit		**30**
Total for year		**(Class work + exam) ≤ 100**

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

Deadlines and exam retaking rules	Assignments submitted after the deadline without valid reasons will be graded lower. Resitting of modules will be allowed with the permission from the lecturer and in the presence of valid reasons (e.g. medical reasons).
Academic integrity rules	Cheating during tests and exams is strictly prohibited (including the use of mobile devices). Coursework and research papers must contain correct citations for all sources used.
Attendance rules	Class attendance is mandatory. In case of objective reasons (such as illness or international internships), individual learning may be allowed (in online format by the approval of the dean of the faculty).

9. **Teaching and learning aids:**

- e-learning course of the discipline https://elearn.nubip.edu.ua/course/view.php?id=1477 ;
- references to digital educational resources:

- Crop production manual. FAO. 2020. Available at: https://www.fao.org/3/ca7556en/CA7556EN.pdf
- Statistics in Agriculture. Available at: https://fao.org/faostat
- Ministry of Agriculture Politics http://www.minagro.kiev.ua/
- Technology of cultivation (field crops) http://agro-business.com.ua/
- Technology of cultivation (field crops) https://www.agronom.com.ua/

- Crop Production Technology Systems. Methodological Guidelines for Practical and Independent Work for Full-Time and Part-Time Students of Specialty 075 "Marketing", Bachelor's Degree Level. Authors: Kalenska S.M., Honchar L.M., Mazurenko B.O. 2023. 80 pages.
- guidelines for studying a discipline by full-time and part-time students;

10. **Recommended sources of information**

- CROP PRODUCTION GUIDE AGRICULTURE. Tamil Nadu Agricultural University. Link: https://www.freebookcentre.net/biology-books-download/gotoweb.php?id=13855
- Graham Thiele, Michael Friedmann, Hugo Campos, Vivian Polar, Jeffery W. Bentle. Root, Tuber and Banana Food System Innovations. Springer, 2022. DOI: https://doi.org/10.1007/978-3-030-92022-7
- Kalenska S., Dmytrishak M., Antal T., Mazurenko B., Crop production with basis of fodder production, Kyiv, 2021. [In Ukrainian]
- Petrichenko V.F., Lykhochvor V.V. Roslynnytstvo. Novi tekhnolohii vyrashchuvannia polevykh kultur: pidruchnyk. - 5-te vid., vyrav., dopov. Lviv: NVF "Ukrainski tekhnolohii", 2020. 806 p. (Title: Crop Production. New Technologies for Field Crop Cultivation: Textbook)