


**NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCES OF
UKRAINE**
Department of Plant Science

"APPROVED"

Dean of the Faculty of
**Plant Protection, Biotechnology and
Ecology**

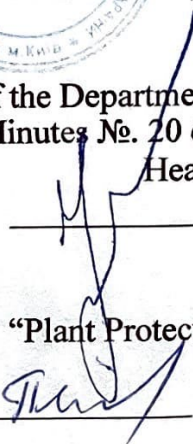



Yulia Kolomiets
2024 y.

"APPROVED"

at the meeting of the Department of Plant Science _
Minutes №. 20 of "15" May 2024 y.

Head of the Department
Svitlana Kalenska



"REVIEWED"

Guarantor of the AP "Plant Protection and Quarantine"


Myroslav Pikovskyi

CURRICULUM OF ACADEMIC DISCIPLINE

**PLANT SCIENCE AND THE BASICS OF FODDER
PRODUCTION**

Field of knowledge	20 Agricultural sciences and food
Specialty	202 Plant Protection and Quarantine
Academic programme	Plant Protection and Quarantine
Faculty	Plant Protection, Biotechnology and Ecology
Author(s):	Bohdan Mazurenko, PhD in Agronomy

Description of the discipline
Plant science and the basics of fodder production

Academic degree, specialty, academic programme		
Academic degree	Bachelor's	
Specialty	202 “Plant Protection and Quarantine”	
Academic programme	Plant Protection and Quarantine	
Characteristics of the discipline		
Type	Compulsory	
Total number of hours	120	
Number of ECTS credits	4	
Number of modules	3	
Form of assessment	<i>Exam</i>	
Indicators of the discipline for full-time and part-time forms of university study		
	Full-time	Part-time
Year of study	3	
Semester	5	
Lectures	<i>30 hours</i>	
Practical classes and seminars	<i>- hours</i>	
Laboratory classes	<i>30 hours</i>	
Self-study	<i>60 hours</i>	
Number of hours per week for full-time students	<i>4 hours</i>	

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

Aim to provide the theoretical knowledge and practical skills of the production of plant products, skills in the rational choice and effective use of various elements of technology in order to increase the productivity of culture and reduce the cost of production

Objectives to develop the students' knowledge and skills based on the study of plant biological characteristics, students will be able to further develop measures and methods for optimizing environmental factors to maximize the potential of agricultural crop productivity. The discipline is based on the knowledge about the plants of field culture, the peculiarities of their development, the requirements for environmental factors, modern techniques and technologies for the cultivation of high yields of high quality at the lowest cost of labor and funds. In turn, crop production is the basis for such sciences as economics and organization of agricultural production.

Acquisition of competences:

Integral competence (IC):

The ability to solve complex specialized tasks and practical problems in professional activities related to plant protection and quarantine, and to apply theoretical knowledge and methods of phytosanitary monitoring, inspection, analysis, and expertise characterized by complexity and uncertainty of conditions.

General competences (GC):

GC 2. The ability to apply knowledge in practical situations.

GC 3. Knowledge and understanding of the subject area and understanding of professional activities.

GC 6. Skills in using information and communication technologies for professional activities.

Special (professional) competences (SC):

SC8. The ability to comprehensively apply methods for long-term regulation, development, and spread of harmful organisms to economically non-detectable levels based on forecasting, economic thresholds of harm, effectiveness of beneficial organisms, energy-efficient and environmentally friendly technologies, ensuring reliable plant protection and environmental safety in accordance with the WTO SPS Agreement and the provisions of EU legislation.

Expected Learning Outcomes (ELO):

ELO 6. Correctly utilize appropriate methods of observation, description, identification, classification, cultivation of agrobiocenoses, and maintaining their stability to preserve natural biodiversity.

ELO 7. Create technological maps for organizing plant protection measures.

ELO 8. Be able to coordinate, integrate, and improve the organization of production processes during plant protection measures.

2. Programme and structure of the discipline for:

- full-time (part-time) form of study;
- reduced full-time (part-time) form of study

Modules and topics	Number of hours													
	full-time							part-time						
	weeks	total	including					in total	including					
			l	p	lab	ind	s.st		l	p	lab	ind	s.st	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Module 1: Food crops. Morphological and biological features of crops S														
Topic 1. Winter cereals: general characteristics (wheat, rye, triticale, barley).		14	2		2		10	14	2	2				10
Topic 2. Spring cereals: early spring cereal crops (wheat, barley, oats).		4	2		2			4						4
Topic 3. Late spring cereals		14	2		2		10	14						14

(corn, millet, sorghum, foxtail millet, rice, buckwheat).													
Topic 4. Grain legumes (peas, soybeans, beans, lentils, chickpeas, lupins, fodder legumes).		4	2	2			4						4
Topic 5. Root and tuber crops		4	2	2			4						4
Total for module 1		40	10	-	10	-	20	40	2		2		36
Module 2: Industrial and niche crops													
Topic 6. Sugar crops (sugar beets).		14	2	2		10	14						
Topic 7. Oil crops (sunflower, rapeseed, oil poppy, etc.).		4	2	2			4						
Topic 8. Essential oil crops (coriander, cumin, fennel, mint, sage, etc.).		4	2	2			14						
Topic 9. Fiber crops (flax, hemp, cotton).		14	2	2		10	4						
Topic 10. Energy crops (plants for various fuel production: biodiesel, bioethanol, solid fuels).		4	2	2			4						
Total for module 2	40		10	-	10	-	20	40			-		40
Module 3: Mechanization in crop production. Theoretical basis of Labor protection													
Topic 11. Field forage production.			2	2									
Topic 12. Pasture forage production.			2	2									
Topic 13. Harvesting and preservation of silage.			2	2		10							
Topic 14. Major agrometeorological factors and ways of their effective utilization in agriculture.			2	2		10							
Topic 15. Climate and its importance for agriculture. agrometeorological forecasts.			2	2									
Total for module 3	40		10	10		20	40						40
Total hours	120		30	-	30	-	60	120	2	2	-		116

3. Topics of laboratory (practical, seminar) classes

№	Topic title	Hours
1	General characteristics of grain crops. Morphological characteristics of grain crops.	2
2	Botanical and morphological characteristics of wheat, rye, triticale, barley, oats: species and their characteristics.	2
3	Corn, sorghum, rice, buckwheat: morphological features, description based on natural samples.	2
4	General characteristics of grain legumes (peas, soybeans,).	2
5	Tubers: potatoes - botanical characteristics. Root crops	2
6	Sugar crops: sugar beets - morphological features, anatomical structure of the root.	2
7	Oil crops: sunflower - determination of oil crops by seeds, fruits, and seedlings. Agrobiological monitoring of growth and development.	2
8	Essential oil crops: general characteristics, determination by seeds, fruits, and seedlings. systematics and determination of morphological features.	2
9	Fiber crops: general characteristics, systematics, and determination of morphological features of roots, stems, fruits, seeds. anatomical structure of flax and hemp stems.	2
10	Energy crops: systematics and determination of characteristics of energy plants for various types of biofuels.	2
11	Feed classification: comparative evaluation of different feed groups.	2
12	Grain and legume grain crops: significance, feed value, use in feed production system, and preparation for feeding.	2
13	Silage, non-traditional feed crops, and intermediate crops.	2
14	Characteristics of main forage grasses and pastures	2
15	Composition of forage mixtures.	2
Total		30

4. Tools for assessing expected learning outcomes:

- exam;
- module tests;
- presentation of laboratory and practical works;
- other types.
-

5. Teaching methods:

- verbal method (lecture, discussion, interview, etc.);
- practical method (laboratory, practical classes);
- visual method (illustration, demonstration);

- processing learning resources (note-taking, summarising, reviewing, writing an abstract);
- video method (remote, multimedia, web-based, etc.);
- self-study (completing assignments);
- individual research work;
- other types.

6. Assessment methods:

- exam;
- oral or written assessment;
- module tests;
- essays and reports;
- presentation of laboratory and practical works;
- presentations at academic events
- other types.

7. Distribution of points received by students

The assessment of students' knowledge and skills is conducted by means of a 100-point scale and is converted into national grades according to Table 1 of the current *Exam and Credit Regulations at NULES of Ukraine*.

Student's rating, points	National grading of exams and credits	
	exams	credits
90-100	excellent	pass
74-89	good	
60-73	satisfactorily	
0-59	unsatisfactorily	fail

To determine a student's rating in the discipline R_{DIS} (up to 100 points), the received assessment rating R_A (up to 30 points) is added to the academic performance rating R_{AP} (up to 70 points): $R_{DIS} = R_{AP} + R_A$.

9. Teaching and learning aids

- e-learning course <https://elearn.nubip.edu.ua/course/view.php?id=3676>
- lectures and presentations (in electronic form);
- textbooks, manuals, tutorials;
- guidelines for studying a discipline by full-time and part-time students;

10. Recommended sources of information

1. *CROP PRODUCTION GUIDE AGRICULTURE. Tamil Nadu Agricultural University.* Link: <https://www.freebookcentre.net/biology-books-download/gotoweb.php?id=13855>
2. 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>
3. Kalenska S.M., Dmytryshak M.Ya., Mokriyenko V.A. *Zernovi ta zernobobovi kultury. Navchalnyi posibnyk.* - Vinnytsia: TOV "TVORY". 2020. 366 p. (Title: Cereals and Legume Crops. Educational Manual)
4. Mazur V.A., Polishchuk I.S., Tekalo N.V., et al. *Roslynnnytstvo. Navchalnyi posibnyk.* – Vinnytsia: TOV "Druk". 2020. 352 p. (Title: Crop Production. Educational Manual)
5. Petrichenko V.F., Lykhochvor V.V. *Roslynnnytstvo. 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)
6. *Roslynnnytstvo z osnovamy kormovyrobnytstva ta agrometeorolohii. Chastyna 1: pidruchnyk/* S.M. Kalenska, M.Ya. Dmytryshak, V.A. Mokriyenko, et al. – Kyiv: Printeko, 2023. 610 p. (Title: Crop Production with Basics of Forage Production and Agrometeorology. Part 1: Textbook)