NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCES OF UKRAINE

Department of Plant Science

"CONFIRMED"
Dean of the Faculty of Plant Protection,
Biotechnologies and Ecology
_____ (KolomiyetcYu.V.)
"___" _____2023

"APPROVED"
at the meeting of the department of Plant Science
Protocol № 20 dated "21"_04_2023 y.
Head of Department
_____Svitlana KALENSKA

"CONSIDERED"
Guarantor of educational program
Plant Protection and Quarantine
_____M. Y. Pikovskyi

SYLLABUS
Academic Discipline "PLANT SCIENCE AND THE BASICS OF FODDER PRODUCTION"
for QL "Bachelor"

Specialty – 202 Plant Protection and Quarantine

Educational program – Plant Protection and Quarantine

Faculty of Plant Protection, Biotechnology and Ecology

Developers: assistant **Mazurenko Bohdan**
Ph. D in Agronomy

Kyiv–2023 y.

1. DESCRIPTION OF CORSE
PLANT SCIENCE AND THE BASICS OF FODDER PRODUCTION

Field of knowledge, direction, specialty, education		
Education and qualification level	*Bachelor's*	
Specialty	202 “Protection and Plant Quarantine	
Educational program	Plant Protection and Quarantine	
Characteristics of training programme		
Type	Compulsory	
The total number of academic hours	85	
Number of ECTS credits	3	
Number of content modules	2	
Forms of assessment	Exam	
Indicators of the course for full-time and part-time forms of study		
	Full-time	**Part-time**
Course (year of study)	3	-
Semester	5	-
Lecture classes	15 *hr.*	-
Practical, seminar classes	30 *hr.*	-
Laboratory classes	- *hr.*	-
Self-study	40 *hr.*	-
Individual assignments		-
Number of weekly classroom hours for the full-time form of study	2	

2. Purpose, objectives, and competencies of the course

Purpose of the course is 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 is to develop the students' knowledge and skills in the 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.

Studying the technologies of production of crop production requires from students certain knowledge on the basics of agriculture, soil science, land reclamation, agrochemistry, plant growing, etc.

Upon completion of this course, students should be able to know:

– main directions of development of crop production in Ukraine and the world;

– economic importance, biological characteristics of field crops, distribution and productivity potential;

– modern technologies of cultivation of high, ecologically pure crops in different soil-climatic zones of Ukraine;

– ways to improve the quality of agricultural products;

– measures to prevent harvest losses during harvesting, transportation and storage;

– ways to reduce the cost of labor to grow a crop.

be able to:

– plan and organize the implementation of work processes in crop production using agricultural machinery, fertilizers and pesticides;

– to apply the achievements of science and best practices in production;

– to plan the production of quality, environmentally friendly products with minimum energy and labor costs at its maximum output per unit time per unit area;

– to use operational information for timely and qualitative holding of a complex of agricultural works, prevention of emergence and elimination of negative situations in the process of production of plant products.

Acquisition of competencies:

Integrated competency (IC):_____

General competencies (GC):

GC 4. The ability to communicate in the official language both orally and in writing._

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

Program learning outcomes (PLO):

PLO 3. Ability to forecast the development and spread of harmful organisms, enabling the implementation of state policies in the field of plant protection and quarantine.

3. Program and structure of the course for:

– complete full-time (part-time) form of study;

– shortened full-time (part-time) form of study.

Names of content modules and topics	Number of hours												
	Full-time form							Part-time form					
	weeks	total	including					total	including				
			l	p	lab	ind	self		l	p	lab	ind	self
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content Module 1. Organizational-economic, biological and agrotechnological bases of plant science. Winter and spring cereals. Legumes													
Topic 1. Plant science as branch of agriculture. Condition of modern plant science in Ukraine and world.		6		5	-	2							
Topic 2. Technology of crop production		10		4		6							
Topic 3. Cereals is a basis of agriculture.		18		8		6							
Topic 4. Legumes: value, biological characteristics, growth technology		10		2		6							
Total for content module 1	44			16		20							
Content Module 2. Industrial crops.													
Topic 5. Tuber and taproot crops		11				4							
Topic 6. Oil crops		12		4		6							
Topic 7. Fiber crops		6		2		2							
Topic 8. Medicinal and aromatic crops		4		2		2							
Topic 9. Niche crops		8		2		6							
Total for content module 2	51			14		20							

Total hours					40							
Course project (work) on _____ _____ _ (if included in the curriculum)		-	-	-		-		-	-	-		-
Total hours	85											

4. Seminar topics

№	Topic title	Number of hours
1	Not provided	

5. Practical class topics

№	Topic title	Number of hours
1	General characteristics of agriculture crops. Classification of crops by families. Botanical classification of crops. Structure of plants.	2
2	Technology of crop production. Elements and main points.	4
3	True cereals (Gramineae). Species and varieties of wheat, triticale, rye. Features of growing and uses these crops.	4
4	Millet-like cereals (Gramineae). Biological characteristics of Zea and sorghum . Species and subspecies of Zea and sorghum. Biological features of millet and rice. Biological features of buckwheat. Structure of buckwheat plant.	4
5	Common characteristics of Legumes.	2
6	General characteristics of industrial and tuber crops. Potato, differentiation on group of varieties.	2
7	Taproot crops and their characteristics. Beet, species differentiation. Botanical and biological characteristics.	2
8	Oil plants and essential oil. Sunflower and his classifications. Castor oil plant. Oil crops from Brassicaceae, Asteraceae and Legumes. Oil crop from other families	4
9	Fiber crops. Hemp, flax, cotton.	2
10	Medicinal and aromatic crops	2
11	Niche crops. Energy crops	2
	Totally	**30**

6. Laboratory class topics

№	Topic title	Number of hours
1	Not provided	

7. Independent work topics

№	Topic title	Number of hours
1	Not provided	

8. Samples of control questions, tests for assessing the level of knowledge acquisition by students.

Form № N-5.05
F-7.5-2.1.6-24

NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCE OF UKRAINE

QL «Bachelor» Educational program «**Plant protection and Quarantine**»	**Department of Plant Science** 2023-2024 educational year	**EXAM TICKET #15** Discipline: **PLANT SCIENCE AND THE BASICS OF FODDER PRODUCTION**	**Approved** Head of department _____ (sign) Kalenska S.M. _____ 2023

Exam questions (essay – 100-200 words) – Екзаменаційні запитання

1. **Types of sowing the agriculture crops** (*Способи сівби с.-г. культур)*
2. **Biological peculiarities of sunflower** (*Біологічні особливості соняшнику*)

Tests

1.	**Mais(corn) forms two types of inflorescences. There are …** (Назвіть 2 види суцвіть у кукурудзи)
A	**Ear/spike** (колос)
B	**Corncob** (початок)
C	**Panicle** (волоть)
D	**Flowerhead** (кошик)_

2.	**Fruit of family Fabaceae (Legumes) is.** (Плід бобових це…)
A	**Caryopsis** (зернівка)
B	**Pod/pulse** (біб)
C	**Silicle** (стручок)

3.	**Root vegetables(taproots, example sugar beet) is … crops** (Коренеплоди за циклом розвитку це…)
A	**Annial** (однорічні)
B	**Biennial** (дворічні)
C	**Perennial** (багаторічні)

4.	**High oil content (more 30 %) forms in seed of:** (Високий вміст олії в зерні у …)
A	**Wheat** (пшениця)
B	**Mais** (кукурудза)
C	**Soja** (соя)

5. **Cereals have a low oil contents in seeds. (*True or false*)**

6.	**Essential oils in fennel and anise are containing in** (ефірна олія в анісу та фенхелю міститься в)
A	**Stem/sprout** (пагін/стебло)
B	**Seed** (насіння)
C	**Inflorescence** (суцвіття)
D	**Root** (корінь)

7.	**Fruit of Cereals (fam. *Graminea*) is.** (Плід злакових це…)
A	**Caryopsis** (зернівка)
B	**Pod/pulse** (біб)
C	**Silicle** (стручок)

8.	**Stem of cereals is** (Коренеплоди за циклом розвитку це…)
A	**Strow** (соломина)
B	**Vine** (лоза/ліана)
C	**Tuber** (бульба)

9.	**High oil content (more 30 %) forms in seed of:** (Високий вміст олії в зерні у …)
A	**Wheat** (пшениця)
B	**Mais** (кукурудза)
C	**Sunflower** (соняшник)

10. **Flax (*Linum*) cultivating for fiber and seeds. (*True or false*)**

9. Teaching methods

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

1. in terms of transmission and perception of educational information :
- verbal (lecture);
- visual (illustration , demonstration);
- practical (laboratory work);

2. in terms of logic and thinking:
- explanatory, illustrative (presentation);
- reproductive (short test papers);

3. in terms of management training:

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

4. in terms of a team:
- incentives (extra points for abstracts);

5. aspect of self-employment:
- Training Module : structural logic scheme;
- sample tests

10. Forms of assessment

Forms of control students used to the discipline: Current, landmark and final control.

Current control knowledge is an integral part of the whole educational process and serves as a means of identifying the degree of perception (learning) training material. Learning management is possible only on the basis of the current control. The tasks are reduced to the current control order:

- identify the scope, depth and quality perception (mastering) of the material being studied;
- identify deficiencies in knowledge and identify ways to address them;
- identify the degree of responsibility of students and their attitudes to work, finding the causes that hinder their work;
- identify the level of mastering the skills of independent work and identify ways and means of development;
- stimulate students' interest in the subject and in the knowledge of their activity.

The main task of this control - to help students organize their work, learn independently, responsibly and systematically study all subjects.

Block (thematic, modular) control of knowledge is an indicator of quality study of selected chapters and topics related cognitive, methodological, psychological and organizational qualities of students.

Final control is carried out with students to assess their knowledge and skills in the discipline. The main goal - establishing actual content in terms of student learning, the quality and depth of skills and apply them in practice. Final control. In the discipline we apply a differentiated final control of exhibiting total points for the educational process and final control.

11. Distribution of grades received by students. Evaluation of student knowledge is carried out on a 100-point scale and is converted to national grades according to Table 1 "Regulations and Examinations and Credits at NULES of Ukraine" (order of implementation dated 26.04.2023, protocol №10)

Student rating, points	**National grade based on exam results**	
	Exams	**Credits**

90-100	**Excellent**	**Passed**
74-89	**Good**	
60-73	**Satisfactory**	
0-59	**Unsatisfactory**	**Not passed**

In order to determine the rating of a student (listener) in the discipline $\mathbf{R_{dis}}$ (up to 100 points), the rating from the exam $\mathbf{R_{ex}}$(up to 30 points) is added to the rating of a student's academic work $\mathbf{R_{aw}}$ (up to 70 points): $\mathbf{R_{dis} = R_{aw} + R_{ex}}$.

11. Methodical supply

Course at eLearn https://elearn.nubip.edu.ua/course/view.php?id=3676

12. Required and recommended literature

Basic:

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., Dmytrishak M., Antal T., Mazurenko B., Crop production with basis of fodder production, Kyiv, 2021. [In Ukrainian]
4. 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)

Additional sources of information

1. Crop production manual. FAO. 2020. Available at: https://www.fao.org/3/ca7556en/CA7556EN.pdf
2. Statistics in Agriculture. Available at: https://fao.org/faostat
3. Ministry of Agriculture Politics http://www.minagro.kiev.ua/
4. Technology of cultivation (field crops) http://agro-business.com.ua/
5. Technology of cultivation (field crops) https://www.agronom.com.ua/
6. Precision farming (Demo tools for studying) https://www.agrivi.com/blog/precision-farming/

7. All about pesticides https://pesticidestewardship.org/homeowner/understanding-pest-management/