NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCES OF UKRAINE

Department of Plant Science

"CONFIRMED"
Dean of the Faculty
of Agricultural Management
_____ Anatoliy Ostapchuk
"___" _____2023 p.

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

"REVIEWED "
Program Coordinator "Management"

Program Coordinator
_____ Vitalii Lutsiak

PROGRAM OF THE COURSE

SYSTEMS OF TECHNOLOGIES: CROP PRODUCTION

Specialization **073"Management"**
Educational program **Management**
Faculty of **Agricultural Management**

Developers: **Bohdan Mazurenko**, PhD in Agronomy
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Kyiv – 2023 y.

1. **Description of the course**

Systems Of Technologies: Crop Production

Field of knowledge, specialization, educational program, educational degree		
Educational degree	*Bachelor's*	
Specialization	*073 "Management"*	
Educational program	*Management*	
Characteristics of the course		
Type	Compulsory	
Total number of hours	72 (120)	
Number of ECTS credits	2.4 (4)	
Number of content modules	2	
Course project (work) (if applicable)	–	
Form of assessment	*Exam*	
Indicators of the course for full-time and part-time forms of study		
	Full-time form of study	Part-time form of study
Course (year of study)	1	1
Semester	1	1
Lecture classes	*18 hr.*	*4 hr.*
Practical, seminar classes	*- hr.*	*2 hr.*
Laboratory classes	*18 hr.*	*- hr.*
Self-study	*36 hr.*	*- hr.*
Individual assignments	*hr.*	*66 hr.*
Number of weekly classroom hours for the full-time form of study	*4 hr.*	

2. **Purpose, objectives, and competencies of the course**

Purpose 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.

Objectives is to gain practical skills in producing high-quality, ecologically clean products with minimal energy and labor costs and maximum output per unit time and area, which requires the wide implementation of varietal, intensive, energy- and resource-saving ecologically sound technologies. Theoretical basis of labor protection, legal basis of labor protection for workers in crop production, safety engineering in crop production, and fire safety in crop production are covered. The course is aimed at forming a system of knowledge on crop production among future specialists, developing skills in rational selection and effective application of different elements of technology in order to increase crop productivity, reduce the cost of production, and enhance the competitiveness of the products obtained.

Acquisition of competencies:

Integrated 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 process of learning, which involves the application of theories and methods of social and behavioral sciences.

General competencies (GC):_

GC 4. Ability to apply knowledge in practical situations;

GC 5. Knowledge and understanding of the subject area and understanding of professional activity.

Professional (special) competencies (PC):_

PC 7. Ability to choose and use modern management tools.

Program learning outcomes (PLO):

PLO 5. Describe the content of the functional spheres of an organization's activity.

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. Management of the production process of cultivation technologies of cereals													
Topic 1. The development of plant science and agriculture as a production industry. The current state of plant production in Ukraine and worldwide.	1	6	2	-	2	-	2	5	1	-	-	4	-
Topic 2. Cereals is a basis of crop production	2	8	2	-	2	-	4	7	1	-	-	6	-
Topic 3. Organizational principles of effective winter wheat cultivation.	3	8	2	-	2	-	4	10	2	-	-	8	-
Topic 4. Early and late spring cereals – organizational principles of effective cultivation	4	8	2	-	2	-	4	8	-	-	-	8	-
Topic 5. Legumes.	5	8	2	-	2	-	4	8	-	-	-	8	-

Management in cultivation technologies of peas and soybean													
Total for content module 1	38		10	-	10	-	18	38	4	-	-	34	-
Content Module 2. Organization of cultivation of industrial crops (raw materials) for processing industry.													
Topic 6. Tuber crops. general characteristics features at management of production	6	8	2	-	2	-	4	6	-	-	-	6	-
Topic 7. Root crops. Sugar beets is a main raw material for sugar production	7	8	2	-	2	-	4	8	-	2	-	6	-
Topic 8. The place of oil crops in Ukraine and the world. Choosing a crop and management in its cultivation	8	8	2	-	2	-	4	10	-	-	-	10	-
Topic 9. Sunflower and rapeseed - the main oil crops of Ukraine and the world	9	10	2	-	2	-	6	10	-	-	-	10	-
Total for content module 2	34		8	-	8	-	18	34	-	2	-	32	-
Total hours	72		18	-	18	-	36	72	4	2	-	66	-

4. Seminar topics

№	Topic title	Number of hours

5. Practical class topics

№	Topic title	Number of hours

6. Laboratory class topics

№	Topic title	Number of 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
Total		18

7. Independent work topics

№	Topic title	Number of hours
1	Spring barley: significance, 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
	Total	36

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 «**Management**»	**Department of Plant Science** 2023-2024 educational year	**EXAM TICKET #15** Discipline: **System of technologies: crop 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 26.04.2021, 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): $\mathbf{R_{dis} = R_{aw} + R_{ex}}$ **.**

12. Educational and methodological support.

1. Program Of The Course SYSTEMS OF TECHNOLOGIES: CROP PRODUCTION
2. Course of lectures of the discipline “SYSTEM OF TECHNOLOGY: CROP PRODUCTION” for students of specialty 073 "Management", education degree «Bachelor». 2021.
3. SYSTEM OF TECHNOLOGY:CROP PRODUCTION. Methodical recommendations for practical works and individual study of the discipline for students of specialty 073 Management, education degree «Bachelor»
4. eLearn – https://elearn.nubip.edu.ua/course/view.php?id=459

13. 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., 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/