

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

Department of Plant Science

“APPROVED”

Dean of the faculty of
Plant Protection, Biotechnology
and Ecology

Sc.D. _____ J. Kolomiets
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DISCUSSED AND APPROVED

on the meeting of the
Department of Plant Science
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Head of the department
_____ prof. S.M. Kalenska

SYLLABUS

**Academic Discipline “PLANT SCIENCE AND THE BASICS OF
FODDER PRODUCTION”
for QL “Bachelor”**

Specialty – 202 Protection and Plant Quarantine

Syllabus compiled by: graduate teaching assistant Mazurenko Bohdan

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

Field of knowledge, direction, specialty, education		
Branch of knowledge	20 «Agricultural science and food»	
Specialty	202 “Protection and Plant Quarantine	
Education and qualification level	bachelor	
Characteristics of training programme		
Type	Normative	
The total number of academic hours	85	
Number of ECTS credits allocated	3	
Number of modules	2	
Forms of control	Examination	
Indicators of academic discipline for full-time and part-time forms of training		
	Full-time	Part-time
Year (course)	3	-
Semester	5(1)	-
Number of lectures	15	-
Practical and seminary sessions	30	-
Laboratory sessions (activities)		-
Independent study	40	-
Number of hours a week		--
Full-time leaning:		
auditorium	2	
own training	3	

2. Goal and objectives of academic discipline

THE OBJECT AND ASSIGNMENTS OF THE COURSE

Goal 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

Learning 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

3. Program of Academic Discipline “ PLANT SCIENCE AND THE BASICS OF FODDER PRODUCTION”

MODULE 1. Organizational-economic, biological and agrotechnological bases of plant science. Winter and spring cereals. Legumes

Lecture 1. Plant science as branch of agriculture. Condition of modern plant science in Ukraine and world. Task and purpose of studying the discipline "Technology of crop production ". Concept and content of growing technology. Crop production as one of the main branches of agricultural production. Features of development crop production in Ukraine, dynamics of crop area structure, yield crops, production level and product quality. Scientific fundamentals of technologies of cultivating crops. Communication discipline with other disciplines. The role of domestic scientists in the development of scientific principles of plant growing. Agro-industrial grouping of agricultural crops. Methods of research in crop production. Basic regularities of crop formation. Ways to control the development of plants. Ways of intensification of the crop production industry in the world and Ukraine.

Lecture 2. Winter wheat: value, biological characteristics, growth technology. The value of winter wheat in increasing the production of food grains. Agricultural and organizational value of winter wheat. Morphobiological features, the ratio of winter wheat to heat, moisture, light, soils and nutrients. Features of plant growth and development. Essence, features and purpose of intensive technology of winter wheat cultivation. Features of common and high technology. Economic efficiency of intensive technology. Technology of growing irrigated lands. Resource-saving technology.

Lecture 3. Spring cereals: value, biological characteristics, growth technology. Value and distribution in Ukraine and the world of late spring crops. Corn is an important grain, grain, silage and technical culture. Morphobiological features of the conditions for growing corn. The phenomenon of heterosis. The most important hybrids, varieties and their economic characteristics. Intensive corn growing technologies. Features of intensive technology of corn cultivation on irrigated lands. Methods of harvesting corn for grain.

Lecture 4. Legumes. Pea and soybean: value, biological characteristics, growth technology. The value of legumes in increasing the production of food grains and solving the problem of fodder protein. The chemical composition of grain, straw and green mass. Symbiosis of legumes and bulbous bacteria. The agricultural and organizational and economic importance of legume crops.

Pea is the most important and one of the most widely spread grain bean culture in Ukraine. Food and feed value. Pea is a steaming culture. Intensive Pea Growing Technology. Features of reaching and harvesting peas for grain.

Soybean is the main protein and oil crop of world production. Soybeans Intensive Soybean Growing Technology. Features of reaching and harvesting soybean.

MODULE 2. Industrial crops.

Lecture 5. Tuber crops. General characteristics and features of growth technologies. Origin, distribution and significance of tuberous plants. The chemical composition of the tubers. Potatoes are a universal culture. Food, fodder, technical value of potatoes. Condition and prospects of potato production. Requirements of potato to growing conditions. Features of growth and development.

Features of growing early potatoes. Potato culture on peat soils. Summer planting potatoes in the south. Growing of two-yield potatoes in the southern regions for irrigation. Application of physiologically active substances.

Lecture 6. Taproot crops. Sugar beet: general characteristics and features of growing technology. Taproot plants: peculiarities of development, their chemical composition. The development of beetroot, prospects for the production of sugar raw materials and improving the quality of products. Fodder value of beet sugar. Ways to increase content and sugar output. Agrotechnical measures of optimization of plant life factors. Agroclimatic zones of beet seeding and their characteristics.

Sugar beet hybrids. A complex of agrotechnical measures for the cultivating of the programmed sugar beet harvest. Integrated system of crop protection from pests, diseases and weeds. Systems of basic cultivation of soil. Fertilization of beet sugar, application of trace elements. Early-summer soil cultivation. Preparation of seed for sowing. The lines and methods of sowing. Power area, planting density. Sowing rates. Seed on the final density. Requirements for stairs quality. A complex of measures that ensure the receipt and preservation of high-quality stairs. Ways of forming the density of planting of plants and beet plantations. Organization and methods of gathering. Basic techniques for the cultivation of royal beets and seeds.

Lecture 7. General characteristics of sunflower and rape oil plant. Biological features and growth technology. True oil plants (sunflower, mustard, rape) and crops of complex uses (flax, hemp, etc). Botanical diversity and national importance of oilseeds. The chemical nature of vegetable oil and the most important indicators of its quality. Status and prospects of oilseed crops production in Ukraine.

Sunflower is the main oilseed crop. Value, area of sowing, yield, best practices. Botanical features and biological characteristics. Features of growing by intensive technology: the use of high-grade varieties, prospects for the use of hybrids.

Rape is a highly productive culture of universal use. The main biological features of culture. Winter rape causes of freezing and basic parameters of culture when entering the winter. Features of cultivation and use of food, feed, technical purposes and as raw materials for alternative biofuels.

4. The structure of the curriculum of academic discipline for full-time form of training

№	Themes and modules to be covered	Hour			
		Full-time			
		total	lecture	practical work	Independent study
MODULE 1. Organizational-economic, biological and agrotechnological bases of plant science. Winter and spring cereals. Legumes					
1	Plant science as branch of agriculture. Condition of modern plant science in Ukraine and world.	6	2	2	2
2	Technology of crop production	10	-	4	6
3	Cereals is a basis of agriculture.	18	4	8	6
4	Legumes: value, biological characteristics, growth technology	10	2	2	6
	Totally in module 1	44	8	16	20
MODULE 2. Industrial crops.					
5	Tuber and taproot crops	11	3	4	4
6	Oil crops	12	2	4	6
7	Fiber crops	6	2	2	2
8	Medicinal and aromatic crops	4	-	2	2
9	Niche crops	8	-	2	6
	Totally in module 2	51	7	14	20
	TOTAL, hours	85	15	30	40

5. Themes of seminary classes

#	Name of theme	Number of hours
	Not provided	

6. Themes of practical classes

#	Name of theme	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

7. Themes of laboratory activities

#	Name of theme	Number of hours
	Not provided	

8. Themes for independent study

#	Name of theme	Number of hours
1	Growth and development, phenological phases of cereals	2
2	Methods of control over winter crops of winter crops	2
3	Rye: value, biological characteristics, growing technology.	2
4	Spring barley: value, biological characteristics, growing technology.	2
5	Winter and spring triticale: value, biological characteristics, growing technology.	2
6	Sorghum and Soris: Importance, Biological Features, Growing Technology.	2
7	Millet: value, biological characteristics, growing technology.	2
8	GMOs: Values, Lacks and Benefits	4
9	Lupin and cheakpea: value, biological characteristics, growing technology	2

10	Organic production in Ukraine and in the world	6
11	Rape: value, biological characteristics, growing technology.	4
12	Common hop: value, biological characteristics, growing technology.	2
13	Lavender: value, biological characteristics, growing technology.	2
14	Medicinal plant: value, biological characteristics, growing technology.	6
	Totally	40

9. Individual study

Writing abstracts on relevant topics, participating in scientific and practical conferences, calculations, solving situational tasks, preparing presentations on selected topics.

10. Teaching methods

Verbal, visual, practical

11. Forms of control

Modules, exam

12. Evaluation and grading

Grading system: National and ECTS

National grade	Grade according to national system	Percentage score
passed	Excellent	90 – 100
	Good	74-89
	Satisfactory	60-73
Not-passed	Unsatisfactory	0-59

13. Required and recommended literature

Basic:

1. Технології сільськогосподарської продукції. Книга 1. Технології виробництва продукції рослинництва. Підручник. / [Танчик С. П., Дмитришак М. Я., Мокрієнко В.А., Дудченко В. М.] - К.: Видавничий дім "Слово", 2012 . - 704 с.
2. Рослинництво. Практикум (лабораторно-практичні заняття). / [Зінченко О. І., Коротєєв А. В., Каленська С. М., Демидась Г. І., Петриченко В. Ф., Салатенко В. Н., Федорчук М. І., Ткачук В. М., Білоножко В. Я.] - Вінниця: Нова Книга. - 2010. - 536 с.