CATALOG OF ELECTIVE DISCIPLINES

6B08 - Agriculture and Bioresources
(Code and classification of the field of education)

6B081 - Agronomy
(Code and classification of the direction of training)

0812
(Code in the International Standard Classification of Education)

B077 - Crop production
(Code and classification of the educational program group)

6B08102 - Green fields technologies
(Code and name of the educational program)

bachelor
(Level of preparation)

set of 2024

Semey 2024

Developed
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Reviewed
at the meeting of the Commission on Academic Quality of the Faculty of Veterinary Medicine and Agricultural Management by protocol No. 3 of January 09, 2024.
at a meeting of the Academic Quality Commission
Research School of Veterinary Medicine and Agriculture.
Recommended for approval by the University Academic Council
Protocol No. 6 dated June 06, 2024

Approved
at a meeting of the University Academic Council by protocol No. 3 of January 16, 2024.

at a meeting of the University Academic Council by protocol No. 6 of June 18, 2024.

Adaptive plant-grower

Discipline cycle	Basic disciplines
Course	2
Credits count	8
Knowledge control form	Examination

Short description of discipline
It is aimed at the formation of theoretical knowledge and practical foundations of adaptive crop production, development, development and introduction into production of economically reasoned technologies for the production of natural high-grade, environmentally safe agricultural products. It covers the main ways to increase yields and maximize agricultural products based on increasing soil fertility and introducing leading cultivation technologies, managing the main factors of plant life, carbon nutrition and ways to reduce the negative impact of environmental factors.

Purpose of studying of the discipline
to teach students to find rational effective developments, methods and methods aimed at solving complex problems of organizing and producing high-quality crop production in modern agriculture under any agro-climatic conditions.

Learning Outcomes
ON5 To apply new methods of cultivating crops, taking into account soil and climatic conditions and biological characteristics of plants; to justify the method of harvesting crops, primary processing of crop products and storing them.

Learning outcomes by discipline
"1) Determines the compliance of growing conditions with the requirements of agricultural crops (varieties).
2) develop fertilizer application systems taking into account soil properties and biological characteristics of plants.
3) Has methods of searching varieties in the register of zoned varieties."

Prerequisites
Fundamentals of scientific research in crop production

Postrequisites
Production practice 3

Agrometerology

Discipline cycle	Basic disciplines
Course	2
Credits count	8
Knowledge control form	Examination

Short description of discipline
The discipline considers the most important agrometeorological factors that determine the living conditions, productivity of plants; the use of the features of the weather, climatic conditions of the area in agriculture. Considers the main instruments in agrometeorology, the concept, significance of solar radiation, temperature and humidity of soil, air, the importance of precipitation for agriculture, the influence of adverse factors on the growth and development of crops.

Purpose of studying of the discipline
To acquaint students with the basics of agrometeorology, its role in the development of agricultural production and solving food problems of mankind.

Learning Outcomes
ON2 To predict the phases of crop development, weather conditions, the influence of factors on yield and use them correctly in agriculture; to describe the morphological features of plant organs; knowledge of the essence of the physiological processes taking place in the plant cell, biological features.

Learning outcomes by discipline
1) Know the composition, measurement methods and ways of effective use of solar radiation, temperature, water regime of soil and air in crop production; meteorological phenomena dangerous for agriculture and measures to combat them; rules and methods of application of agrometeorological and climatic information in agronomy;
2) Be able to monitor solar radiation, temperature, humidity of air and soil, precipitation and other meteorological factors; make agrometeorological forecasts, analyze agrometeorological conditions of a specific period; evaluate the agro-climatic resources of the territory; plan and conduct field
work taking into account the peculiarities of the thermal and humidity regime of agricultural landscapes;
3) Possess: modern methods of assessing the natural resource potential of the territory for the purposes of agricultural production; types and methods of agrometeorological observations and forecasts; skills of organizing and conducting field work and making managerial decisions in various weather conditions of agroecosystems functioning; methods of protecting crops from dangerous meteorological phenomena.

Prerequisites
School course

Postrequisites
Soil science Crop production Agriculture

Bonitization and classification of soils

Discipline cycle	Basic disciplines
Course	2
Credits count	8
Knowledge control form	Examination

Short description of discipline
The discipline is aimed at studying the principles of land valuation and soil valuation. Considers the classification and assessment of soils by productivity, the production value of soil bonification, agricultural production grouping of soils and the methodology for determining the bonus score. Provides information on the structure of the soil cover and long-term information on the yield of the main

crops of agriculture, dedicated to specific soils in Kazakhstan and abroad.

Purpose of studying of the discipline

The purpose of the discipline is to form students` knowledge, practical skills and abilities (in accordance with the competencies being formed) on the theoretical foundations of regulating water, air, thermal and salt regimes of soils in combination with appropriate agrotechnics to ensure optimal conditions for the growth and development of crops.

Learning Outcomes

ON3 To recognize the main types and varieties of soils, to justify the directions of their use in agriculture and methods of fertility reproduction; to complete tillage units, to carry out technological adjustments of agricultural machines.

Learning outcomes by discipline

To know: the scheme of the soil formation process, morphological features of soils, composition and properties of soils, their structure, fertility and agricultural use, soil maps and
cartograms, typology and classification of lands, fertility reproduction techniques.
Be able to: analyze various situations, critically assess their advantages and disadvantages, outline ways and choose means of their development or elimination; recognize
soil-forming minerals and rocks, determine morphological and other properties, describe the structure of the soil profile, recognize types and varieties of soils.
Possess: the skills of professional operation of modern equipment and devices used in agricultural production; the skills of determining and
agronomic assessment of soils based on morphological characteristics and chemical analysis data, compiling agricultural production bonuses and grouping soils.

Prerequisites

Soil science

Postrequisites

Agricultural reclamation

Precision farming basics

Discipline cycle	Basic disciplines
Course	2
Credits count	8
Knowledge control form	Examination

Short description of discipline

The discipline "Precision farming basics " teaches students innovative methods in agriculture using the latest technologies to improve crop quality and the use of Smart technologies. The course examines theoretical and practical knowledge of the application of digital methods, navigation and geographic information systems, the use of accurate remote sensing data, such as images or video images from drones or satellites, which allow you to collect, process and analyze data online.

Purpose of studying of the discipline

The main purpose of studying this course is to familiarize students with a comprehensive high-tech agricultural management system, including global positioning technologies (GPS), geographic information systems (GIS), yield assessment technologies (Yield Monitor Technologies), variable rationing (Variable Rate Technology), remote sensing of the earth (remote sensing) and aimed at obtaining the maximum volume of high-quality and cheapest agricultural products, taking into account environmental safety standards.

Learning Outcomes

ON6 To develop rational and resource-saving farming systems; to carry out agrotechnical measures to protect soils from erosion and deflation; to carry out all types of reclamation works, to use irrigation methods and techniques.

Learning outcomes by discipline

to know: the system of formation of field plans for agriculture and land management of an agricultural enterprise, as well as the structure of acreage;
be able to: distribute crops across fields, taking into account their geographical location, area and direction of the farm;
possess: methods of calculating the occupied acreage in the structure of an agricultural enterprise;

Prerequisites

Information and communication technology

Postrequisites

Production practice 3

Agricultural Phytopathology

Discipline cycle	Basic disciplines
Course	2
Credits count	8
Knowledge control form	Examination

Short description of discipline

It is aimed at studying diseases of agricultural crops; systems of measures to protect crops from diseases; pathogens: actinomycetes, viruses, bacteria and fungi. Particular attention is paid to the search for ways to reduce the harm caused to agricultural production by phytopathogenic organisms, signs of diseases depending on the zone of plant growth, methods of protection; causes of diseases; features of the development of pathogens, methods of protection.

Purpose of studying of the discipline

To study the system of measures to protect crops from diseases. Pathogens of diseases: actinomycetes, basidiomycetes viruses, bacteria, etc.

Learning Outcomes

ON7 To conduct surveys of agricultural lands for the presence of pests and plant diseases, to identify the main types of pests and diseases, to develop integrated systems of plant protection measures.

Learning outcomes by discipline

1) Develop environmentally sound integrated plant protection systems and agrotechnical measures to improve the phytosanitary condition of crops.
2) Takes into account the economic thresholds of harmfulness when justifying the need for application.
3) Selects the optimal types, norms and terms of use of chemical and biological plant protection products for effective control of weeds, pests and diseases.

Prerequisites
Agricultural entomology

Postrequisites
Protection of crops from pests and diseases

Plant biology

Discipline cycle	Basic disciplines
Course	3
Credits count	5
Knowledge control form	Examination

Short description of discipline
Formation of knowledge about plant morphology and anatomy, plant reproduction, the basics of plant florography and systematics, components of geobotany, ecosystems and phytogeography of plants, as well as the necessary minimum of general theoretical knowledge and practical abilities in plant physiology. Analyzes the processes of consumption of water and minerals by plant roots. It gives an idea of the creation of organic matter by green plants, respiration,
reproduction, growth and development of plants and their adaptability to external factors.

Purpose of studying of the discipline
The purpose of this course is to provide students - future agronomists with highly qualified knowledge on morphology, anatomy and physiology of various plant species, knowledge of the basics of cytology and histology of plants; knowledge of biochemical processes taking place in plant cells, features of the photosynthesis process in green plants, the basics of systematics and geography of plants.

Learning Outcomes
ON2 To predict the phases of crop development, weather conditions, the influence of factors on yield and use them correctly in agriculture; to describe the morphological features of plant organs; knowledge of the essence of the physiological processes taking place in the plant cell, biological features.

Learning outcomes by discipline
to know the differences between a plant organism and an animal; the differences between a plant cell and an animal; the role of autotrophic, heterotrophic, symbiotrophic organisms in the circulation of substances and energy conversion on Earth;
be able to distinguish the levels of morphological organization of plants;
have the skills to describe the biomorphological organization of plants;

Prerequisites
School course

Postrequisites
Crop production

Plant quarantine

Discipline cycle	Profiling discipline
Course	3
Credits count	5
Knowledge control form	Examination

Short description of discipline
The discipline forms the concept of accounting methods and identification of quarantine facilities. Studies the morphology and biology of external and internal quarantine facilities, as well as signs of damage to plants by pests and symptoms of diseases. Considers methods for the identification, localization and elimination of quarantine facilities, analysis of phytosanitary risk, methods of inspection of quarantined products, examination of quarantined materials, methods of disinfection of quarantined products and measures to combat them.

Purpose of studying of the discipline
Formation of students` understanding of quarantine pests, diseases and weeds on the territory of the Republic of Kazakhstan and in neighboring countries

Learning Outcomes
ON7 To conduct surveys of agricultural lands for the presence of pests and plant diseases, to identify the main types of pests and diseases, to develop integrated systems of plant protection measures.

Learning outcomes by discipline
acquire skills in conducting phytosanitary monitoring, a set of protective measures for agricultural plants against pests, diseases and weeds, as well as quarantine facilities; conducting all stages of quarantine inspection at customs posts. They can also be employed at the state plant protection and quarantine service, scientific and production structures of the Ministry of Agriculture of the Republic of Kazakhstan, centers for phytosanitary diagnostics and forecasts, plant quarantine centers and control and toxicological laboratories.

Prerequisites
Protection of crops from pests and diseases

Postrequisites
Production practice 3

The forecast of the development of pests and diseases

Discipline cycle	Profiling discipline
Course	3
Credits count	5

Knowledge control form	Examination

Short description of discipline
Examines the essence of the forecast of plant pests, its goals, objectives and practical significance, as well as the periods of reproduction of harmful organisms and their significance for the forecast. Studies the biological basis of the prognosis of plant diseases, including long-term, long-term and short-term prognosis of plant diseases. In the course of training, the student learns the methods of forecasting fungal diseases of crops and viral diseases of plants.

Purpose of studying of the discipline
To teach students to build comprehensive systems for the protection of major crops, including agrotechnical, mechanical, physical, biological and chemical measures, which should be based on predicting the level of development of harmful organisms and their harmfulness, based on taking into account biotic and abiotic factors.

Learning Outcomes
ON7 To conduct surveys of agricultural lands for the presence of pests and plant diseases, to identify the main types of pests and diseases, to develop integrated systems of plant protection measures.

Learning outcomes by discipline
Know: methods of accounting, forecasting and signaling the timing of disease control of major crops
Be able to: use methods of detecting and accounting for diseases
Possess: methods of estimating expected crop losses, methods of forecasting the spread and signaling the timing of disease control of cereals, potatoes, vegetables, fruits and berries, industrial crops, vineyards

Prerequisites
Agricultural entomology Agricultural Phytopathology

Postrequisites
Integrated plant protection

Agricultural reclamation

Discipline cycle	Profiling discipline
Course	3
Credits count	5
Knowledge control form	Examination

Short description of discipline
It forms an idea of further increasing the fertility of the earth, a steady increase in agricultural production based on the scientific use of irrigation and drainage, chemical land reclamation, and cultural and technical measures.
The course includes: water regime of the active soil layer and its regulation; irrigation reclamation; reclamation of waterlogged mineral territories and swamps; soil cultivation, agricultural water supply and irrigation.

Purpose of studying of the discipline
students receive theoretical knowledge and practical skills about the fundamental improvement of lands, the essence of chemical, biological, irrigation and drainage reclamation and methods of their implementation; coverage of environmental protection issues, formation of ideas about the main types of reclamation, the need for reclamation work in Kazakhstan.

Learning Outcomes
ON3 To recognize the main types and varieties of soils, to justify the directions of their use in agriculture and methods of fertility reproduction; to complete tillage units, to carry out technological adjustments of agricultural machines.

Learning outcomes by discipline
to know: - the general characteristics, essence and conditions of application of sprinkler irrigation;
- characteristics of sprinkler machines and installations.
be able to: - determine the need for the number of sprinkler machines in the household.

Prerequisites
Soil science

Postrequisites
Innovative agricultural technologies in agriculture

Legislation in the field of crop production

Discipline cycle	Profiling discipline
Course	4
Credits count	5
Knowledge control form	Examination

Short description of discipline
The discipline studies the systems of scientific knowledge about agrarian law and agrarian legislation, which are necessary for agricultural specialists to work effectively in modern times. The course examines the basic laws in the field of crop production, as well as requirements for the safety of crop production, rules for the implementation of varietal and seed control and subsidizing services in the field of crop production in various areas, grain expertise and the issuance of a grain quality passport.

Purpose of studying of the discipline
To form a system of fundamental knowledge among students necessary for the subsequent preparation of a bachelor`s degree, capable of working with normative legal documents in the field of legal regulation of agricultural activities, as well as the effective solution of practical problems of legal regulation of agricultural production, in accordance with the competencies being formed.

Learning Outcomes
ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Learning outcomes by discipline
1) know the basic laws in the field of crop production.
2) To carry out grain expertise and issue a grain quality passport.
3) to carry out varietal and seed control.

Prerequisites
Bases of economics, law and ecological knowledge
Postrequisites
Pre-diploma practice

Pre-diploma practice

Discipline cycle	Profiling discipline
Course	4
Credits count	15
Knowledge control form	Total mark on practice

Short description of discipline
Carries out development of rational and resource-saving systems of agriculture; carries out agrotechnical actions for protection of soils from erosion and deflation; formation of professional competences; acquisition of skills of organizational and administrative work on management of agriculture. To solve organizational and economic issues in making adjustments to agricultural techniques, taking into account the prevailing weather conditions of a particular year.
Purpose of studying of the discipline
The purpose of the practice is the processing of experimental material collected during the period of industrial practice, the completion of research work and the writing of a thesis
Learning Outcomes
ON4 To conduct field research experiments, to argue the results of research, to prepare all kinds of scientific works.
ON5 To apply new methods of cultivating crops, taking into account soil and climatic conditions and biological characteristics of plants; to justify the method of harvesting crops, primary processing of crop products and storing them.
Learning outcomes by discipline
1. collection, processing and generalization of practical material on the topic of research work (project);
2. analysis of statistical data and practical material on the research topic;
3. formulation of conclusions, patterns, recommendations and suggestions on the topic of research work (project) or report.
Prerequisites
Production practice 2
Postrequisites
Final examination

Production practice 3

Discipline cycle	Profiling discipline
Course	4
Credits count	15
Knowledge control form	Total mark on practice

Short description of discipline
To use modern progressive technology of cultivation of spring, row crops, industrial crops; methods for determining the quality of seed material, selection and seed production; fundamentals of technology for storage and processing of crop products, including cereals, vegetables and other crops.
Purpose of studying of the discipline
The purpose of the practice is to consolidate theoretical knowledge in the courses of profile disciplines, to familiarize with the main production processes in agriculture and to prepare students for independent work in production in their specialty
Learning Outcomes
ON7 To conduct surveys of agricultural lands for the presence of pests and plant diseases, to identify the main types of pests and diseases, to develop integrated systems of plant protection measures.
ON9 Use modern technology for growing vegetable crops in open and closed soils; plan work in greenhouses and greenhouses.
ON10 To carry out all types of breeding work, taking into account the basic laws of plant genetics and biotechnology; to determine the varietal and sowing qualities of seeds.
Learning outcomes by discipline
1. collection, processing and generalization of practical material on the topic of research work (project);
2. analysis of statistical data and practical material on the research topic;
3. formulation of conclusions, patterns, recommendations and suggestions on the topic of research work (project) or report.
Prerequisites
Production practice 2
Postrequisites
Final examination

Agricultural entomology

Discipline cycle	Basic disciplines
Course	2
Credits count	8
Knowledge control form	Examination

Short description of discipline
Forms the concept of agricultural plant pests, biological features of agricultural pests, methods of combating crop pests. The course includes: methods of plant protection from agricultural pests, quarantine measures, agrotechnical, biological, chemical, organizational and production measures, plant reactions to damage and pest control measures, reduction of crop losses from harmful insects.
Purpose of studying of the discipline
to study the morphological and biological features of pests of agricultural crops and methods of plant protection from pests

Learning Outcomes
ON7 To conduct surveys of agricultural lands for the presence of pests and plant diseases, to identify the main types of pests and diseases, to develop integrated systems of plant protection measures.
Learning outcomes by discipline
1) have theoretical knowledge about the structure, lifestyle and ecology of the main, practically important in agriculture, representatives of insect orders.
2) determine the necessary and sufficient measures to control agricultural pests.
3) diagnose insects by morphological and anatomical signs, as well as by the nature of damage to plants, and carry out a description of pests, determine the types of typical pests of agricultural crops.
Prerequisites
Agricultural Phytopathology
Postrequisites
Protection of crops from pests and diseases

Vegetable growing

Discipline cycle	Basic disciplines
Course	3
Credits count	5
Knowledge control form	Project

Short description of discipline
It is aimed at teaching classification of vegetable crops, their origin, features of growth and development, selection and seed production of vegetable crops. The improvement of technologies of cultivation of vegetable crops in open and closed ground is given in relation to certain conditions. Focused on the study of world methods of growing vegetable crops in greenhouse conditions, the requirements of vegetable crops to environmental factors, diseases and pests of vegetable crops, measures to combat them.
Purpose of studying of the discipline
To study methods of growing vegetable crops in greenhouse conditions. Types of greenhouses and greenhouses. Modern models of greenhouses and greenhouses. Requirements of vegetable crops for heat, air, environment, humidity
Learning Outcomes
ON9 Use modern technology for growing vegetable crops in open and closed soils; plan work in greenhouses and greenhouses.
Learning outcomes by discipline
""1)know the biology and morphology of the main vegetable crops; seeds of vegetable crops; agrotechnics of the main vegetable crops; varieties of vegetable crops; factors for improving plant growth.
2) be able to grow seedlings; select fields for vegetable crops; select varieties for the conditions of the region; prepare seeds for sowing.
3) possess the skills of drawing up technological schemes for the cultivation of vegetable crops; techniques for selecting the assortment of vegetable crops for specific soil-ecological conditions."
Prerequisites
Plant biology
Postrequisites
Production practice 3

Greenhouses

Discipline cycle	Basic disciplines
Course	3
Credits count	5
Knowledge control form	Examination and term work/Project

Short description of discipline
The discipline is aimed at studying the national economic significance of grenhouses. An idea is given about the types of greenhouses depending on seasonal use, about the structures of greenhouses of the frame, hangar type, about the types of regimes in the greenhouse, about compliance with thermal and light regimes. Includes: the biological basis of vegetable growing and the classification of vegetable crops, the concept of varietal and sowing qualities of vegetable seeds, growing crops in a greenhouse
Purpose of studying of the discipline
Formation of theoretical knowledge on the biology of vegetable crops, organizational and economic features of protected soil and practical skills in the preparation and application of technologies for their cultivation in conditions of various types of cultivation facilities.
Learning Outcomes
ON9 Use modern technology for growing vegetable crops in open and closed soils; plan work in greenhouses and greenhouses.
Learning outcomes by discipline
1) to know the ways of obtaining vegetable products, modern technologies for the production of vegetable products in the closed ground.
2) be able to manage the technological processes of production of vegetable production in the closed ground.
3) have the skills to perform technological techniques for growing vegetables in protected ground.
Prerequisites
Plant biology
Postrequisites
Fruit growing

Aquaponics

Discipline cycle	Basic disciplines
Course	3
Credits count	3

Knowledge control form	Examination

Short description of discipline
This discipline teaches students high-tech farming methods combining aquaculture and hydroponics. The Aquaponics course includes: the relationship of processes and biological objects, the purpose and sequence of technological stages of crop and livestock production; general and private technological schemes for growing the main types of crops in open and closed ground conditions; as well as features of aquaculture cultivation in open and closed ecosystems.

Purpose of studying of the discipline
formation of the necessary theoretical knowledge about the systematic approach and environmentally oriented production of agricultural products.

Learning Outcomes
ON9 Use modern technology for growing vegetable crops in open and closed soils; plan work in greenhouses and greenhouses.

Learning outcomes by discipline
- to determine the need of various types of vegetable crops in the composition of the nutrient medium;
- to determine the technological modes of cultivation of freshwater fish, depending on their class and species;
- to identify different strains of microorganisms.

Prerequisites
Introduction to the specialty

Postrequisites
Innovative agricultural technologies in agriculture

Aeroponics

Discipline cycle	Basic disciplines
Course	3
Credits count	3
Knowledge control form	Examination

Short description of discipline
The discipline is aimed at familiarizing students with modern equipment and the principles of their operation when using aeroponic and hydroponic technologies in the production of crop products with increased productivity, product quality and economic efficiency. The course describes the features of growing vegetables in an air environment without a substrate by spraying the roots with a nutrient solution, and about managing the mineral nutrition of plants using automation.

Purpose of studying of the discipline
to explore alternative (aeroponics and hydroponics) and compare with the traditional (soil) method of growing plants.

Learning Outcomes
ON9 Use modern technology for growing vegetable crops in open and closed soils; plan work in greenhouses and greenhouses.

Learning outcomes by discipline
- to determine the need of various types of vegetable crops in the composition of the nutrient medium;
- to determine the technological modes of cultivation of freshwater fish, depending on their class and species;
- to identify different strains of microorganisms.

Prerequisites
Introduction to the specialty

Postrequisites
Innovative agricultural technologies in agriculture

Hydroponics

Discipline cycle	Basic disciplines
Course	3
Credits count	3
Knowledge control form	Examination

Short description of discipline
The discipline "Hydroponics" examines the history of the emergence, development and current state of hydroponics, its advantages over traditional methods of growing plants, the importance of hydroponic technologies for the production of plant products. He studies the main hydroponic systems, methods and techniques for growing seedlings of vegetable and berry crops on hydroponic installations, methods of sowing, picking, planting seedlings in hydroponic systems, types of substrates and preparation of mixtures of fertilizers and solutions, calculations of the needs of areas, soils.

Purpose of studying of the discipline
to provide students with theoretical knowledge and practical skills of growing crops in protected ground using modern technologies.

Learning Outcomes
ON9 Use modern technology for growing vegetable crops in open and closed soils; plan work in greenhouses and greenhouses.

Learning outcomes by discipline
- to determine the optimal technological parameters and modes of cultivation of various types of vegetable crops;
- to carry out sowing and plant care work;
- take into account the specific species characteristics of plants during harvesting and further use in the food industry.

Prerequisites
Introduction to the specialty

Postrequisites
Innovative agricultural technologies in agriculture

Biological protection of plants

Discipline cycle	Basic disciplines

Course	3
Credits count	5
Knowledge control form	Examination

Short description of discipline
It is aimed at studying the methods and principles of measures to combat plant diseases and pests using biological objects - entomophages, herbiphages, pathogens and antagonists of the most important pests, weeds and pathogens of agricultural crops. Includes: occurrence, causes of development and forecasting, spread of diseases and pests, biological characteristics of pests and diseases, measures to combat them.

Purpose of studying of the discipline
to study the methods and principles of measures to combat plant diseases and pests, the basics of systematics, biology and ecology of the main groups of beneficial organisms-entomophages, herbifages, pathogens and antagonists of the most important pests, weeds and pathogens of agricultural crops; the causes of the dynamics of the number of harmful and beneficial arthropods in biocenoses; methods of their identification and diagnosis

Learning Outcomes
ON7 To conduct surveys of agricultural lands for the presence of pests and plant diseases, to identify the main types of pests and diseases, to develop integrated systems of plant protection measures.

Learning outcomes by discipline
1) Know the classification of organisms used for biological plant protection; advantages of using biological plant protection products.
2) develop and apply environmentally friendly technologies for the use of plant protection products.
3) create plant protection systems, substantiate environmentally safe crop cultivation technologies.

Prerequisites
Protection of crops from pests and diseases

Postrequisites
Production practice 3

Integrated plant protection

Discipline cycle	Basic disciplines
Course	3
Credits count	5
Knowledge control form	Examination

Short description of discipline
This discipline is aimed at studying the system of managing the phytosanitary state of ecosystems, the integrated use of various means, measures of plant protection. Considers ensuring the phytosanitary well-being of the area and sustainable long-term suppression of the number of harmful organisms, regulation of the phytosanitary state of crops, cultivation of resistant highly productive varieties, activation of natural entomophages and acariphages, application of the biological method and the optimal use of pesticides and innovative mechanization.

Purpose of studying of the discipline
to form students` professional competencies in the field of comprehensive protection of agricultural crops from pests and diseases.

Learning Outcomes
ON7 To conduct surveys of agricultural lands for the presence of pests and plant diseases, to identify the main types of pests and diseases, to develop integrated systems of plant protection measures.

Learning outcomes by discipline
1)know a variety of methodological approaches in the modeling and design of integrated plant protection systems;
2) develop integrated plant protection systems against harmful organisms in adaptive landscape farming systems;
3) possess methods of assessing the state of agrophytocenoses of agricultural crops;

Prerequisites
Protection of crops from pests and diseases

Postrequisites
Production practice 3

Chemical protection of plants

Discipline cycle	Basic disciplines
Course	3
Credits count	5
Knowledge control form	Examination

Short description of discipline
This discipline is aimed at studying methods of chemical protection and ways of effective use of chemical plant protection products. Examines the issues of agronomic toxicology, the selectivity of pesticides, the basics of sanitary and hygienic requirements for the use of pesticides. The classification of the main chemical plant protection products by the object of application, forms of chemical agents, calculation of the rate of application of chemicals, methods of application of pesticides, the mechanism of action of pesticides is given.

Purpose of studying of the discipline
The purpose of this course is to provide students with specific knowledge in the field of theory and practice of chemical plant protection

Learning Outcomes
ON6 To develop rational and resource-saving farming systems; to carry out agrotechnical measures to protect soils from erosion and deflation; to carry out all types of reclamation works, to use irrigation methods and techniques.

Learning outcomes by discipline
1) Know the optimal types, norms and terms of use of chemical and biological plant protection products for effective control of weeds, pests and diseases.
2) take into account the economic thresholds of harmfulness when justifying the need for the use of pesticides.

3) conduct phytopathological examination of seeds, diagnose pests, plant diseases, and draw up technological schemes for protecting crops from them.

Prerequisites

Protection of crops from pests and diseases

Postrequisites

Production practice 3

The agrarian economy

Discipline cycle	Profiling discipline
Course	4
Credits count	5
Knowledge control form	Essay

Short description of discipline

The course forms a clear understanding of the current state of the global food market, the main structural changes that have occurred in this industry over the past decades, as well as ways out of the critical situation that has arisen in the agricultural sector at the present stage. Within the framework of this course, economic relations arising from the production, consumption, and sale of agricultural products on a global scale are considered.

Purpose of studying of the discipline

The course is aimed at developing students` general cultural competence related to the ability to think economically.

Learning Outcomes

ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Learning outcomes by discipline

- analyze agricultural markets and the state of agricultural producers
- evaluate the effectiveness of agricultural policy measures
- navigate the main sources of information about the agricultural sector in the world and Kazakhstan

Prerequisites

Bases of economics, law and ecological knowledge

Postrequisites

Pre-diploma practice Production practice 3

Agribusiness

Discipline cycle	Profiling discipline
Course	4
Credits count	5
Knowledge control form	Essay

Short description of discipline

The general theoretical prerequisites and provisions of scientific methods and rules of agribusiness management, the structure and its current situation, the economic foundations of storage of agricultural products, types of product losses and ways to reduce them, the concept of raw materials, its classification and directions of integrated use, ways of placing the raw material base, issues of organization of inter- economic and financial and economic relations in the field of production are considered processing, storage and use of agricultural products.

Purpose of studying of the discipline

to provide future specialists with the theoretical foundations and provisions of scientific methods and rules of conducting agribusiness in order to maximize the return on the capital used by agricultural enterprises.

Learning Outcomes

ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Learning outcomes by discipline

- analyze the state of industries and the activities of agricultural enterprises
- plan the development of agricultural business, make a business plan
- to ensure the rational organization of production and labor, to establish scientifically sound standards and progressive forms of remuneration

Prerequisites

Bases of economics, law and ecological knowledge

Postrequisites

Pre-diploma practice Production practice 3

Management in agriculture

Discipline cycle	Profiling discipline
Course	4
Credits count	5
Knowledge control form	Essay

Short description of discipline

This course contains the most important provisions of management in relation to the economics of agriculture. It includes: theoretical bases in the field of market relations related to the management of enterprises; methods for choosing strategies and tactics, bringing agricultural enterprises to markets; developing and making managerial decisions in modern conditions; issues of managing agricultural enterprises in conditions of steadily growing macroeconomic instability.

Purpose of studying of the discipline

formation of theoretical knowledge, practical skills and project management and management skills in agriculture in the field of resource-saving technologies in adaptive landscape farming.

Learning Outcomes

ON1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Learning outcomes by discipline

- Searches for solutions to the problem situation based on available sources of information.
- Organizes and coordinates the work of the project participants, contributes to the constructive overcoming of emerging disagreements and conflicts, provides the team with the necessary resources.
- to establish the degree of influence of various factors on the performance of an agricultural organization and its divisions, on the effectiveness of a management decision; to find solutions when analyzing specific marketing situations

Prerequisites

Bases of economics, law and ecological knowledge

Postrequisites

Pre-diploma practice Production practice 3

Estimation and setting of norms of quality of plant-grower products

Discipline cycle	Profiling discipline
Course	4
Credits count	5
Knowledge control form	Essay

Short description of discipline

The course focuses on the study of the theoretical and practical foundations of assessing and rationing the quality of crop products, covers the basic concepts of quality and product expertise, the nomenclature of consumer properties, indicators and gradations of quality, organoleptic, laboratory, computational, experimental methods for determining the quality of crop products. Information is given on the rationing and examination of the quality of grain processing products, oilseeds, vegetables, the system of standardization of crop production.

Purpose of studying of the discipline

To acquaint students with theoretical knowledge and to instill in them practical skills on the issues of quality assessment of agricultural products so that they can apply them in production.

Learning Outcomes

ON5 To apply new methods of cultivating crops, taking into account soil and climatic conditions and biological characteristics of plants; to justify the method of harvesting crops, primary processing of crop products and storing them.

Learning outcomes by discipline

"1) to know the biological features of agricultural crops and the technology of their cultivation, the method of harvesting and laying it for storage.
2) to substantiate the technology of sowing crops and caring for them, the method of harvesting and laying it for storage.
3) master the complexes of national, interstate, international standards and technical conditions for crop production and methods of quality determination;"

Prerequisites

Bases of economics, law and ecological knowledge

Postrequisites

Pre-diploma practice Production practice 3

Standardization and certification of crop production

Discipline cycle	Profiling discipline
Course	4
Credits count	5
Knowledge control form	Essay

Short description of discipline

This discipline studies the basics of standardization, metrology, assessment of product quality compliance with requirements and regulatory documents, product safety, consumer properties of agricultural products, quality regulation. It includes: general characteristics of standards of different categories and types, general characteristics of technical regulation, the concept of technical regulations, sanitary and hygienic requirements for product safety, organizational and methodological foundations of standardization, quality and consumer properties of products, standardization of crop production.

Purpose of studying of the discipline

Formation of ideas, knowledge, skills in the field of standardization and metrology, certification, consumer properties of crop products, quality regulation, formation of skills and skills of working with standards and other regulatory documents, expert evaluation of the quality of crop products.

Learning Outcomes

ON5 To apply new methods of cultivating crops, taking into account soil and climatic conditions and biological characteristics of plants; to justify the method of harvesting crops, primary processing of crop products and storing them.

Learning outcomes by discipline

"1) Know the organizational and methodological foundations of standardization, metrology, certification.
2) Classify products and the technological process of their production in accordance with the requirements of regulatory documents.
3) possess modern methods of assessing the quality of agricultural products;"

Prerequisites

Bases of economics, law and ecological knowledge

Postrequisites

Pre-diploma practice Production practice 3