NJSC SHAKARIM UNIVERSITY OF SEMEY

EDUCATIONAL PROGRAM

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)

6B08101 - Agronomy
(Code and name of the educational program)

Bachelor
(Level of preparation)

Semey

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Semey 2023

PREFACE

Developed

The educational program 6B08101 - Agronomy in the direction of preparation 6B081 - Agronomy on the basis of the State Compulsory Standards of Higher and Postgraduate Education approved by the Order of the Ministry of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022 No 2 (as amended by the order) was developed by the Academic Committee dated 20.02.2023 No 66).

Members of the Academic Committee	Full name	Academic degree, academic title, position	Signature
Head of the Academic Committee	Yessengulova Nurlugyl	Dean of the Faculty of Veterinary and Agricultural Management	
Educational program manager	Zakiyeva Araily	senior lecturer of the Department of Agriculture and Bioresources	
Member of the AC	Nurzhanova Kulsara	Head of the Department of Agriculture and Bioresources	
Member of the AC	Kamzina Gulim	senior lecturer of the Department of Agriculture and Bioresources	
Member of the AC	Sakenov Madiyar	Chief Specialist of the Department of Crop Production, Technical Inspection and Mechanization of the Department of Agriculture and Land Relations of the Abai region	
Member of the AC	Tokashev Oralbek	the head of the farm "Balke" Beskaragaysky district of the Abay region	
Member of the AC	Muratova Aida	student of the AG-101 group	
Member of the AC	Ashimirova Fatima	student of the AG-101 group	

Reviewing

Full name of the reviewer	Position, place of work	Signature
Seylgazina Saule	Head of the Feed Crops Department of "VKSHOS" LLP	

Reviewed

At the meeting of the Commission on Quality Assurance of Veterinary Medicine and Agricultural Management
Recommended for approval by the Academic Council of the University
Protocol № 4.1 "06" April 2023
Chairman of the Commission G.Jamanova

Approved at the meeting of the Academic Council of the University Protocol No. 8 "25" April 2023.

Approved

at the meeting of the Academic Council of the University
Protocol № 1 "01" of September 2023
Chairman of the Academic Council of the University D.Orynbekov

Content

1.Introduction

1.1.General data

Educational program implemented NAO "University nashakarim Semey" educational program 6B08101 agronomy, Department of "Agriculture and bio-resources", faculty of agriculture tailored to the needs of the regional labour market, the requirements of the normative documents of the Ministry of education and science of the Republic of Kazakhstan and is a system of documents for organization of educational process.

Educational program reglamentary objectives, expected results, contents, conditions and technologies of realization of educational process, evaluation of quality of training of the graduate in this field of study and contains a description of the program and direction of professional activity of graduates, learning outcomes and acquired competences, the policy of assessing learning outcomes, organization the educational process, providing quality training of students, a description of the modules that make up the educational program, instructional materials,, ensuring the implementation of appropriate educational technologies.

The contents of the educational program is implemented through curriculum developed in a modular format, where for the first level of education includes three subjects: the cycle of General educational disciplines, cycle of basic disciplines and the cycle of majors, and final examination.

The educational program provides for the education of a student with special educational needs in the conditions of a higher educational institution, as well as his socialization and integration into society.

1.2.Completion criteria

The main criterion for the completion of the educational process for the preparation of bachelors is the development of students at least 205 credits of theoretical training, as well as at least 27 credits of practice, 8 credits of final certification.

Total 240 credits.

1.3.Typical study duration: 4 years.

2.PASSPORT OF THE EDUCATIONAL PROGRAM

2.1.EP purpose	The General purpose of the educational program is to provide conditions for a full-fledged, high-quality basic higher education, involving the training of competitive specialists – agronomy, satisfying the needs of society in highly qualified personnel.
2.2.Map of the training profile within the educational program	
Code and classification of the field of education	6B08 - Agriculture and bioresources
Code and classification of the direction of training	6B081 - Agronomy
Code in the International Standard Classification of Education	0812
Code and classification of the educational program group	B077 - Crop production
Code and name of the educational program	6B08101 - Agronomy
2.3.Qualification characteristics of the graduate	
Degree awarded / qualification	
Name of the profession / list of positions of a specialist	The graduate of this educational program is awarded the academic degree "Bachelor of Agriculture". Graduates may hold positions: - agronomy-field-crop growers; - agronomists for plant protection; - meliorators-soil scientists; - farmers-managers; - the leaders of collective farms and firms in the agricultural sector; - inspector of seed control, variety testing, plant protection; inspector for the quarantine inspection at customs; - in all types of laboratories processing plant products; - inspector of territorial inspections
OQF qualification level (industry qualification framework)	6
Area of professional activity	- management (laboratories, farms, agricultural department); - science (research organizations by profile: - agricultural crops, their varieties and hybrids, genetic collections of plants, seeds and planting material, commercial products; - agronomic landscapes, natural forage lands; - soil and its fertility; - fertilizers, pesticides, herbicides; - agricultural machinery and equipment; - technologies of production of crop production and its primary processing; - technologies of storage, transportation and pre-sale preparation of crop production; - processes of organization and management of a structural division of agricultural production, a small enterprise; - primary labor collectives.
Object of professional activity	The objects of professional activity of graduates are: research organizations, the field of management.
Types of professional activity	Graduates of the educational program "Agronomy" can perform the following types of professional activities:

	- production and technological, - organizational and managerial support, - project information, - scientific research. Research activities: - willingness to study modern information, domestic and foreign experience on the subject of research; ability to apply modern methods of scientific research in agronomy according to approved plans and methods; ability to perform laboratory analysis of soil, plant and crop production samples; Production and management activities: the ability to justify the selection of crop varieties for specific conditions of the region and the level of agricultural intensification, to prepare seeds for sowing; readiness to complete tillage, sowing and harvesting units and determine the schemes of their movement in the fields, to carry out technological adjustments of agricultural machines; ability to calculate doses of organic and mineral fertilizers for the planned crop, determine the method and technology of their application for agricultural crops; readiness to justify the system of crop rotations and land management of an agricultural enterprise; readiness to adapt tillage systems for crop rotation crops, taking into account fertility, steepness and exposure of slopes, ground water level, applied fertilizers and a complex of tillage machines; willingness to justify the technology of sowing crops and caring for them; ability to use agrometeorological information in the production of crop products; ability to justify the method of harvesting agricultural crops, primary processing of crop production and its storage; willingness to justify technologies for improving and rational use of natural forage lands, preparation of coarse and juicy feed; ability to ensure labor safety in the production of crop products; Organizational and technological activities: - ability to analyze the technological process as an object of management; - the ability to determine the value of the main production resources of an agricultural enterprise; - the ability to organize the work of performers, find and make management decisions in the field of organization and rationing of labor in different economic and economic conditions; - ability to conduct marketing research in agricultural markets; - willingness to systematize and summarize information on the use and formation of enterprise resources; - willingness to cooperate with colleagues, work in a team; knowledge of the principles and methods of organizing and managing small teams; ability to find

	organizational and managerial solutions in non-standard production situations and willingness to take responsibility for them; - work in a team and communicate effectively with colleagues, management, and consumers; - set goals, motivate the activities of subordinates, organize and control their work with taking responsibility for the result of completed tasks; - be ready to change technologies in your professional activity. Project activities: - Preparation of business plans for agricultural enterprises of all forms of ownership for the production of agricultural crops most adapted to these soil climatic conditions.
Graduate Model	A person who, as a highly qualified specialist in accordance with the requirements of the modern labor market, has mastered the necessary for the professional development of agriculture and professional competencies and was able to form these competencies. He is also an agricultural specialist with comprehensive knowledge in the field of agronomy, able to solve complex tasks for the organization and production of high-quality crop production in modern agriculture.

3.Modules and content of the educational program

Module 1. Fundamentals of social and humanitarian knowledge

Foreign language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	31839 (3020058)
Course	1
Term	1
Credits count	5
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The content of the discipline «Foreign language» assumes the formation of students` intercultural and communicative competencies at B1 level. The discipline is aimed at mastering the knowledge, skills and abilities that allow using a foreign language in interpersonal communication and professional activity. All types of speech activity are taught, such as reading, writing, listening and production of texts of level complexity with a certain degree of grammatical and lexical correctness.

Purpose of studying of the discipline

Formation of intercultural and communicative competence of students in the process of foreign language education at a sufficient level (A2, pan-European competence) and the level of basic sufficiency (B1, pan-European competence). Depending on the level of training, the student at the time of completion of the course reaches the B1 level of the pan-European competence if the language level of the student at the start is higher than the A2 level of the pan-European competence.

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.

Prerequisites

School course

Postrequisites

Foreign language

History of Kazakhstan

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	31841 (3020139)
Course	1
Term	1
Credits count	5
Lections	30hours
Practical and seminar classes	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Qualification examination

Short description of discipline

The main stages of the history of Kazakhstan are studied with: nomadic statehood, Turkic civilization, the era of colonialism, the Soviet period, independence. The driving forces, trends, patterns of historical development are analyzed; problems: ethnogenesis of the Kazakh people, the formation of statehood, national liberation movements, demographic development. The skills of analyzing historical events and facts, working with historical literature are being formed.

Purpose of studying of the discipline

The purpose of the discipline is to provide objective knowledge about the main stages of the development of the history of Kazakhstan from ancient times to the present.

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.

Prerequisites

School course

Postrequisites

Philosophy

Kazakh language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	31837 (3020054)
Course	1
Term	1
Credits count	5
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline is aimed at deepening the acquired knowledge of students in the framework of the school curriculum, as well as the use of language and speech means based on a full understanding of vocabulary and grammatical system of knowledge; the formation of socio-humanitarian worldview of students within the framework of the national idea of spiritual revival; free expression of mobile thought as a means of speech communication and in the process of communication; awareness of the national culture of the people, the ability to distinguish features of national cognition.

Purpose of studying of the discipline

Forms through phraseological units the recognition of national culture, its meaning as a linguistic unit related to spiritual culture; skills of identifying facts of national and cultural significance in the formation of Kazakh phraseology.

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.

Prerequisites

School course

Postrequisites

Kazakh language

Bases of economics, law and ecological knowledge

Discipline cycle	General educational disciplines
Discipline component	University component
SubjectID	31842 (3021473)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Laboratory works	0hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The integrated discipline includes the main issues and principles in the field of fundamentals of law and anti- corruption culture, economics, entrepreneurship and leadership, ecology and life safety. Features of the use of regulatory legal acts, the ability to use the business, ethical, social, economic, entrepreneurial and environmental standards of society. Specifics of environmental-legal, economic, entrepreneurial relations, leadership qualities and principles of combating corruption.

Purpose of studying of the discipline

It consists in studying the basic patterns of the functioning of living organisms, the biosphere as a whole and the mechanisms of their sustainable development under the conditions of anthropogenic impact and emergency situations; in understanding the concept of corruption, the legitimacy of the fight against it, the content of the state penal policy; in the formation of students` basic fundamental stable knowledge on the basics of economic theory, in instilling the skills and abilities of economic thinking; in introducing students to the theory and practice of entrepreneurship, to the basics of creating their own business; in the formation of theoretical knowledge and practical skills for the development and improvement of leadership qualities.

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.

Prerequisites

School course

Postrequisites

Basic and profile disciplines of the EP

Russian language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component

SubjectID	31838 (3020056)
Course	1
Term	1
Credits count	5
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is intended for the development of the language personality of the student, who is able to carry out cognitive and communicative activities in Russian in the areas of interpersonal, social, professional, intercultural communication; for teaching students practical mastery of the Russian language in various areas of communication and various situations, mastering the specifics of functional semantic types and genres of functional styles of speech, enriching the vocabulary with special vocabulary, forming and improving the skills of monologue and dialogic speech.

Purpose of studying of the discipline
The purpose of the program is to form the socio-humanitarian worldview of students in the context of the national idea of spiritual modernization, involving the development on the basis of national consciousness and cultural code of the qualities of internationalism, tolerant attitude to world cultures and languages as translators of world-class knowledge, advanced modern technologies, the use and transfer of which can ensure the modernization of the country and personal career growth of future specialists.

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.

Prerequisites
School course

Postrequisites
Russian language

Physical Culture

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	31840 (3020061)
Course	1
Term	1
Credits count	2
Practical and seminar classes	60hours
Total	60hours
Knowledge control form	Differentiated attestation

Short description of discipline
It provides for the joint cooperation of a teacher and a student in the process of physical education throughout the training in the context of the requirements for the level of mastering the discipline, preparing students for participation in mass sports competitions; forms motivational and value attitudes towards physical culture and the need for systematic physical exercises and sports; gives basic knowledge about the use of physical culture and sports in the development of vital physical qualities.

Purpose of studying of the discipline
The purpose of the program is the formation of social and personal competencies of students and the ability to purposefully use the means and methods of physical culture, ensuring the preservation, strengthening of health to prepare for professional activities; to the persistent transfer of physical exertion, neuropsychic stress and adverse factors in future work.

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.

Prerequisites
School course

Postrequisites
Physical Culture

Kazakh language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	31843 (3020055)
Course	1
Term	2
Credits count	5
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours

Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is aimed at expanding language literacy, free communication with the environment and mental and ideological skills of the student, understanding the role of language in the process of mastering world- class knowledge through the formation of a future specialist`s worldview based on national consciousness and cultural code, improving the knowledge of the state language by future specialists, increasing the scope of use of the Kazakh language by specialists.

Purpose of studying of the discipline
Ensuring high- quality mastery of the Kazakh language as a means of social, intercultural, professional communication through the formation of communicative competencies at all levels of language use.

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.

Prerequisites
Kazakh language

Postrequisites
Basic and profile disciplines of the EP

Foreign language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	31845 (3020059)
Course	1
Term	2
Credits count	5
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The content of the discipline «Foreign language» assumes the formation of students`linguo- cultural, socio- cultural, cognitive and communicative competencies at B2 level. The discipline is aimed at deep and extended study of productive and receptive language material. As a result, the student must be able to understand all types of speech activity in accordance with the requirements of B2 level and master the subject content of the discipline and speech.

Purpose of studying of the discipline
Formation of linguo- culturological, socio- cultural, cognitive and communicative competence of students in the process of foreign language education at the B2 level, pan-European competence. Depending on the level of training, the student at the time of completing the course reaches the level B2 of the pan-European competence, if the language level of the student at the start is higher than the level B1 of the pan-European competence.

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.

Prerequisites
Foreign language

Postrequisites
Basic and profile disciplines of the EP

The module of socio-political knowledge (sociology, political science, cultural studies, psychology)

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	31847 (3020153)
Course	1
Term	2
Credits count	8
Lections	30hours
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	55hours
Independent work of the student	110hours
Total	240hours
Knowledge control form	Examination

Short description of discipline
The module of socio-political knowledge involves the study of four scientific disciplines – sociology, political science, cultural studies, psychology, each of which has its own subject, terminology and research methods. Interactions between these scientific disciplines are carried out on the basis of the principles of information complementarity; integrativity; methodological integrity of research approaches of these disciplines; generality of the methodology of learning, result-oriented; unified system representation of the typology of learning

outcomes as formed abilities.

Purpose of studying of the discipline

Formation of social and humanitarian worldview of students in the context of solving the problems of modernization of public consciousness, defined by the state program "Looking into the Future: Modernization of Public Consciousness".

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.

Prerequisites

School course

Postrequisites

Philosophy

Russian language

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	31844 (3020057)
Course	1
Term	2
Credits count	5
Practical and seminar classes	45hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline is intended for the development of the language personality of the student, who is able to carry out cognitive and communicative activities in Russian in the areas of interpersonal, social, professional, intercultural communication; to teach the scientific style of speech as a language of specialty, the creation of secondary texts, the formation of skills for the production of oral and written speech in accordance with the communicative goal and the professional sphere of communication, instilling the skills of speech etiquette, business rhetoric.

Purpose of studying of the discipline

The purpose of the program is to form the socio-humanitarian worldview of students in the context of the national idea of spiritual modernization, involving the development on the basis of national consciousness and cultural code of the qualities of internationalism, tolerant attitude to world cultures and languages as translators of world-class knowledge, advanced modern technologies, the use and transfer of which can ensure the modernization of the country and personal career growth of future specialists.

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.

Prerequisites

Russian language

Postrequisites

Basic and profile disciplines of the EP

Physical Culture

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	31846 (3020062)
Course	1
Term	2
Credits count	2
Practical and seminar classes	60hours
Total	60hours
Knowledge control form	Differentiated attestation

Short description of discipline

It provides for the joint cooperation of a teacher and a student in the process of physical education throughout the training in the context of the requirements for the level of mastering the discipline, the ability to exercise control and self-control in the process of classes, gaining knowledge on health promotion, hardening and increasing the body`s resistance to the effects of adverse factors of labor activity, mastering methods of selection of physical exercises and sports.

Purpose of studying of the discipline

The purpose of the program is the formation of social and personal competencies of students and the ability to purposefully use the means and methods of physical culture, ensuring the preservation, strengthening of health to prepare for professional activities; to the persistent transfer of physical exertion, neuropsychic stress and adverse factors in future work.

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.

Prerequisites

Physical Culture

Postrequisites
Physical Culture

Information and communication technology

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	31849 (3021472)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is aimed at mastering the conceptual foundations of the architecture of computer systems, operating systems and networks by students; formation of the ability to critically understand the role and signifcance of modern information and communication technologies in the era of digital globalization, new "digital" thinking, knowledge about the concepts of developing network and web applications, skills in using modern information and communication technologies in various felds of professional activity, scientifc and practical work, for self-educational and other purposes.

Purpose of studying of the discipline
Formation of the ability to critically evaluate and analyze processes, methods of searching, storing and processing information, methods of collecting and transmitting information through digital technologies

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.

Prerequisites
School course

Postrequisites
Basic and profile disciplines of the EP

Physical Culture

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	31848 (3020063)
Course	2
Term	1
Credits count	2
Practical and seminar classes	60hours
Total	60hours
Knowledge control form	Differentiated attestation

Short description of discipline
Provides for the joint cooperation of the teacher and the student in the process of physical education throughout the training in the context of the requirements for the level of mastering the discipline; increasing the level of physical fitness and developing physical qualities; mastering the technique of sports; education of discipline, collectivism, comradely mutual assistance; education of mental stability, development and improvement of basic motor qualities - endurance, strength, speed, dexterity, flexibility.

Purpose of studying of the discipline
The purpose of the program is the formation of social and personal competencies of students and the ability to purposefully use the means and methods of physical culture, ensuring the preservation, strengthening of health to prepare for professional activities; to the persistent transfer of physical exertion, neuropsychic stress and adverse factors in future work.

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.

Prerequisites
Physical Culture

Postrequisites
Physical Culture

World of Abai

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	31850 (3020137)
Course	2

Term	1
Credits count	3
Lections	15hours
Practical and seminar classes	15hours
Independent work of a student under the guidance of a teacher	20hours
Independent work of the student	40hours
Total	90hours
Knowledge control form	Examination

Short description of discipline

The discipline is aimed at studying historical facts, the philosophical and artistic foundations of the works of Abay Kunanbaev, Shakarim Kudaiberdiev, which form worldview and aesthetic values, the student`s ability to express his opinion, practical skills and perception of such human qualities as morality, honesty, artistic character. The genius of the writers of Kazakh literature and the role of M. Auezov in the study and popularization of Abai`s heritage, the significance of his works for history, literature and science are determined.

Purpose of studying of the discipline

Formation of the meaning of philosophical and ideological being, understanding of the problems raised in the works of Abai Kunanbayuly, Shakarim Kudaiberdiuly, Mukhtar Auezov and application of the acquired knowledge in the practice of everyday life.

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.

Prerequisites

School course

Postrequisites

Basic and profile disciplines of the EP

Physical Culture

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	31851 (3020064)
Course	2
Term	2
Credits count	2
Practical and seminar classes	60hours
Total	60hours
Knowledge control form	Differentiated attestation

Short description of discipline

Provides for the joint cooperation of the teacher and the student in the process of physical education throughout the training in the context of the requirements for the level of mastering the discipline; acquisition of versatile abilities and skills for the development of physical abilities, socio-cultural experience and socio-cultural values of physical culture and sports; development of communication skills, thinking, self-development, the formation of experience in the implementation of sports and recreational and training programs.

Purpose of studying of the discipline

The purpose of the program is the formation of social and personal competencies of students and the ability to purposefully use the means and methods of physical culture, ensuring the preservation, strengthening of health to prepare for professional activities; to the persistent transfer of physical exertion, neuropsychic stress and adverse factors in future work.

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.

Prerequisites

Physical Culture

Postrequisites

Basic and profile disciplines of the EP

Philosophy

Discipline cycle	General educational disciplines
Discipline component	Compulsory component
SubjectID	31852 (3020053)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline is aimed at developing students` openness of consciousness, understanding their own national code and self-consciousness, spiritual modernization, competitiveness, realism and pragmatism, independent critical thinking, the cult of knowledge and education, a holistic view of philosophy as a special form of understanding the world, mastering key worldview concepts, as well as the development and strengthening of the values of tolerance, intercultural dialogue and a culture of peace.

Purpose of studying of the discipline

Formation in students of a holistic view of philosophy as a special form of knowledge of the world, its main sections, problems and methods of studying them in the context of future professional activities.

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.

Prerequisites

The module of socio-political knowledge (sociology, political science, cultural studies, psychology)

Postrequisites

Basic and profile disciplines of the EP

Module 3. Natural Science

Phytobiology

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	31872 (3020067)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
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. Examines the processes of plant consumption of water and mineral substances by roots, 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 of the highest qualification with knowledge of 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 carry out the prediction of the phases of crop development, weather conditions, the influence of factors on yield and to properly use them in agriculture; to describe the morphological characteristics of plant organs; knowledge of the essence of physiological processes taking place in the plant cell, biological features.

Prerequisites

School course

Postrequisites

Crop production

Introduction to the specialty

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	31873 (3020124)
Course	1
Term	1
Credits count	3
Lections	15hours
Practical and seminar classes	15hours
Independent work of a student under the guidance of a teacher	20hours
Independent work of the student	40hours
Total	90hours
Knowledge control form	Examination

Short description of discipline

The discipline considers the basic concepts of crop production industries in order to create an initial idea of future professional activity, a

body of knowledge about the relationship of agronomy with other branches of production and processing of agricultural products. The main attention is paid to the prospects for the development of modern technologies in agriculture and crop production , the laws of agriculture, the basics of agrochemistry and crop production.

Purpose of studying of the discipline

To acquaint students with the basics of the chosen specialty-agronomy, its role in the development of agricultural production and solving food problems of mankind.

Learning Outcomes

ON2 To carry out the prediction of the phases of crop development, weather conditions, the influence of factors on yield and to properly use them in agriculture; to describe the morphological characteristics of plant organs; knowledge of the essence of physiological processes taking place in the plant cell, biological features.

Prerequisites

School course

Postrequisites

Soil science Crop production Agriculture

Agrometerology

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	31874 (3020068)
Course	1
Term	2
Credits count	3
Lections	15hours
Practical and seminar classes	15hours
Independent work of a student under the guidance of a teacher	20hours
Independent work of the student	40hours
Total	90hours
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 carry out the prediction of the phases of crop development, weather conditions, the influence of factors on yield and to properly use them in agriculture; to describe the morphological characteristics of plant organs; knowledge of the essence of physiological processes taking place in the plant cell, biological features.

Prerequisites

School course

Postrequisites

Soil science Crop production Agriculture

Educational practice

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	31876 (3020100)
Course	1
Term	2
Credits count	2
Study practics	60hours
Total	60hours
Knowledge control form	Total mark on practice

Short description of discipline

During the course of the training practice, the student consolidates the knowledge gained in the process of studying the disciplines of the basic, variable and profile parts; develop practical work skills; get acquainted with modern equipment. Acquires skills: work with educational, scientific, regulatory, methodological and instructional literature, recognition of wild and cultivated plants, the main types of soils; diagnostics of pests and diseases of agricultural crops; agrometeorological observations.

Purpose of studying of the discipline

The main purpose of the educational practice is to consolidate the knowledge acquired in the course of lectures, laboratory classes and independent work of the student, and to obtain professional competencies, acquire practical skills and professional experience.

Learning Outcomes

ON2 To carry out the prediction of the phases of crop development, weather conditions, the influence of factors on yield and to properly use them in agriculture; to describe the morphological characteristics of plant organs; knowledge of the essence of physiological processes taking place in the plant cell, biological features.

Prerequisites
Introduction to the specialty
Postrequisites
Production practice 1

Inorganic and organic chemistry

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	31884 (3020106)
Course	2
Term	1
Credits count	3
Lections	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	20hours
Independent work of the student	40hours
Total	90hours
Knowledge control form	Examination

Short description of discipline
The discipline is aimed at studying the composition, structure, properties, preparation of a chemical reaction. Examines the sections of inorganic, organic chemistry with its main objects: chemical elements, substances, chemical reactions, with its fundamental concepts, laws, theories, patterns of chemical processes; methods of theoretical, experimental research in chemistry; modern possibilities of chemistry; classification, nomenclature, structure of organic compounds; properties, basic methods of synthesis of organic compounds.
Purpose of studying of the discipline
Mastering the achievements of modern chemical science by students and ways of applying the laws of chemistry in professional activity
Learning Outcomes
ON3 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.
Prerequisites
School course
Postrequisites
Agrochemistry

Fundamentals of scientific research in agronomy

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31895 (3020125)
Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline forms an idea of the methods of agronomic research. It includes: the basic definitions and classification of research methods, the basic elements of the methodology of the field experiment; planning and design of agricultural experience, the methodology for laying and conducting field experience; rules for drawing up a program of observations and records, the methodology for accounting for crop yields in the experiment, the procedure for documentation and reporting.
Purpose of studying of the discipline
The purpose of the course "Fundamentals of scientific research in agronomy" is to consider the theoretical foundations of the most important methods of studying
the formation of crop yields.
Learning Outcomes
ON9 To conduct field research experiments, to argue the results of research, to prepare all kinds of scientific works.
Prerequisites
Introduction to the specialty
Postrequisites
Methods of agricultural crops variety testing

Digitalization in agronomy

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	31893 (3020105)

Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
It is aimed at studying the main technologies implemented primarily in the framework of digitalization of the agricultural economy in Kazakhstan. It includes: automation of work with mass, electronic site maps and unmanned aerial vehicles, digital tools for using informative resources, platforms and technologies that increase the effectiveness of modern agricultural production; acquisition of practical skills in using current digital technologies to solve applied problems in agriculture.

Purpose of studying of the discipline
The purpose of the discipline is to form students` knowledge, practical skills and abilities; to study digital tools for using information resources, platforms and technologies that increase the efficiency of modern agricultural production; to gain practical skills in using modern digital technologies to solve applied problems in agriculture.

Learning Outcomes
ON2 To carry out the prediction of the phases of crop development, weather conditions, the influence of factors on yield and to properly use them in agriculture; to describe the morphological characteristics of plant organs; knowledge of the essence of physiological processes taking place in the plant cell, biological features.
ON3 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.
ON4 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.

Prerequisites
Information and communication technology

Postrequisites
Agrolandscape farming system

Module 31.Soil reclamation

The Parking management in agriculture

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31887 (3020070)
Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
To teach students to use technical services in agriculture, the General design of cars and tractors, methods of rational use of technology in production.

Purpose of studying of the discipline
To study the main types of agricultural machinery used for basic and surface tillage, sowing and planting, preparation and fertilization, post-harvest processing of grain and seeds of various crops; irrigation of agricultural land; loading and transportation of agricultural goods.

Learning Outcomes
ON3 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.

Prerequisites
Introduction to the specialty

Postrequisites
Production practice 2

Soil science

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	31886 (3020069)

Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is aimed at studying the origin, genesis, classification, geographical distribution and protection of soils, ways of rational use of it in agricultural production, preservation and improvement of fertility. The course examines the factors of soil formation, chemical composition, physical properties, nomenclature and classification of soils, water, air, thermal properties and soil regimes, regulation of soil regimes and directions of the soil-forming process, the main types and varieties of soils.

Purpose of studying of the discipline
generalization of new theoretical knowledge about soils and their fertility, acquisition of practical skills in diagnostics and qualitative assessment of soils, agricultural production grouping and regulation of soil regimes.

Learning Outcomes
ON10 To recognize the main types and varieties of soils, to justify the direction of their use in agriculture and methods of reproduction of fertility; determine the bonus point.

Prerequisites
Agrometerology

Postrequisites
Agricultural reclamation

Production practice 1

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	31892 (3020102)
Course	2
Term	2
Credits count	5
Working practice	150hours
Total	150hours
Knowledge control form	Total mark on practice

Short description of discipline
During the internship, the student consolidates the knowledge gained in the process of studying the disciplines of the basic, variable and profile parts; develop practical skills; get acquainted with modern equipment. Acquires skills: carrying out basic and pre-sowing tillage, organizing and carrying out sowing of agricultural crops, carrying out technological techniques for caring for crops and plantings of agricultural crops. carrying out protective measures against harmful organisms (weeds, pests and diseases), organizing and carrying out harvesting of agricultural crops, primary processing of crop production and laying it for storage.

Purpose of studying of the discipline
The purpose of practical training 1 is to acquire practical skills in morphology, taxonomy of insect pests and diseases; recognition of the main types and varieties of soils

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

Prerequisites
School course

Postrequisites
Agrochemistry

Agricultural machinery

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31888 (3020071)
Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours

Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline demonstrates the study of agricultural machinery, classification of agricultural machinery for tillage, sowing, planting crops, caring for them and cleaning. It includes: adjustment of the main mechanisms and systems of tractors, agricultural machines; calculation of the need for material and technical means to carry out the production program; selection of the appropriate machine or tool to perform technological operations; rational acquisition of machine-tractor units, production lines.

Purpose of studying of the discipline
The study of the principles of classification of agricultural machines, the device, purpose, adjustment of agricultural machines used for tillage, sowing, planting crops, caring for them and harvesting.

Learning Outcomes
ON3 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.

Prerequisites
Introduction to the specialty

Postrequisites
Production practice 2

Exploitation of machine-tractor Park

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31889 (3020072)
Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is aimed at studying the essence of the rational use of tractor parks in agricultural enterprises. Examines the basics of the production operation of machines and aggregates, the acquisition of machine and tractor units, the choice of the method of organizing field work, ways to increase the coefficients of the useful action of aggregates, the highest annual productivity of power plants, maintenance in the machine and tractor fleet, methods of efficient consumption of combustible materials and auxiliary parts.

Purpose of studying of the discipline
The purpose of studying this course is to master the methods of organizing field work, develop an action plan to increase the efficiency of aggregates, establish technical service in the machine and tractor fleet.

Learning Outcomes
ON3 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.

Prerequisites
Introduction to the specialty

Postrequisites
Production practice 2

Appraisal and classification of soils

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31905 (3020116)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is aimed at studying the principles of land valuation and soil bonification. Considers the classification and evaluation of soils by productivity, the production value of soil bonification, agro-production grouping of soils; information on the structure of soil cover

and long- term information on the yield of the main crops of agriculture, timed to specific soils, the development of agro- climatic justification for the placement of crops, the methodology for determining the score of bonity.

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) about the theoretical foundations of regulating water, air, thermal and salt regimes of soils in combination with appropriate agricultural techniques to ensure optimal conditions for the growth and development of agricultural crops.

Learning Outcomes

ON7 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.
ON10 To recognize the main types and varieties of soils, to justify the direction of their use in agriculture and methods of reproduction of fertility; determine the bonus point.

Prerequisites

Soil science

Postrequisites

Agricultural reclamation

Agro soil science

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31897 (3020073)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

Forms an idea of the agronomic features of soil types and their use. It covers issues of soil fertility, soil modification during anthropogenic use, the origin, evolution and agronomic characteristics of the main types of soils, the reaction of humic substances with the mineral part of the soil, aerobic and anaerobic processes in the soil. Particular attention is paid to environmental, economic and legal problems of land use, soil protection.

Purpose of studying of the discipline

generalization of new theoretical knowledge about soils and their fertility, acquisition of practical skills in diagnostics and qualitative assessment of soils, agricultural production grouping and regulation of soil regimes.

Learning Outcomes

ON3 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.
ON7 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.

Prerequisites

Soil science Inorganic and organic chemistry

Postrequisites

Agricultural reclamation

Agrochemistry

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31908 (3020136)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The course of this discipline includes: creating the best conditions for plant nutrition, taking into account the knowledge of the qualities of different types and structures of fertilizers, the personalities of their relationship with the soil, determining very effective forms, methods and timing of the introduction of fertilizers. Studies the quantitative and qualitative composition of macro - micro fertilizers,

complex fertilizers, organic fertilizers, the effect of fertilizers on the environment, methods of agrochemical research.

Purpose of studying of the discipline

formation of knowledge, skills and practical skills on the basics of nutrition of agricultural crops, which are the scientific basis for the intensification of agricultural production due to economically sound, resource-saving and environmentally safe use of fertilizers

Learning Outcomes

ON3 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.

Prerequisites

Soil science

Postrequisites

Agricultural reclamation

Bonitization and qualitative assessment of soils

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31907 (3020127)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

This discipline is aimed at studying the general principles of soil bonification and qualitative assessment, comparative assessment of soil quality, their potential fertility and productive capacity. Considers modern methods of soil assessment, soil assessment according to I.I. Karmanov, soil assessment according to T.N. Kulakova, soil assessment according to V.D. Ivanov, issues of qualitative assessment of land for various soil-climatic regions, agricultural grouping of arable land and the recommended set of crops.

Purpose of studying of the discipline

To study the general principles and methods of bonitization and qualitative assessment of soils taking into account soil and climatic conditions.

Learning Outcomes

ON7 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.
ON10 To recognize the main types and varieties of soils, to justify the direction of their use in agriculture and methods of reproduction of fertility; determine the bonus point.

Prerequisites

Soil science

Postrequisites

Agricultural reclamation

Soil and plant diagnostics

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31906 (3020117)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline is aimed at studying the basics of plant nutrition diagnostics, the availability of plants with chemical elements, the influence of the chemical composition and biological characteristics of the variety on the growth rate and duration of vegetation periods. The article considers the implementation of plant diagnostics taking into account the history of fields, soil and agrochemical maps, the results of experiments and zonal recommendations for the use of fertilizers for a specific crop, the use of types of diagnostics: chemical, morpho-biometric, diagnostics of the need of plants for fertilizers.

Purpose of studying of the discipline

Ensuring constant control over growing conditions and adjusting plant nutrition during the growing season, which contributes to a more complete use of soil nutrients and fertilizers

Learning Outcomes

ON3 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.

Prerequisites

Soil science

Postrequisites

Agricultural reclamation

Technology is the use of fertilizers

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31898 (3020074)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

It is aimed at studying the main methods, terms and methods of technology for the use of fertilizers, taking into account the soil and climatic conditions of the region. Special attention is paid to the methods of forming favorable conditions for plant nutrition using fertilizers, the specifics of their interaction with the soil, the correct composition of the system of introduction of fertilizers of individual crops, crop rotation, the impact of various agrotechnical measures on the effectiveness of fertilizers, the advantages of using organic fertilizers and the development of technology; calculation of the fertilizer application rate

Purpose of studying of the discipline

The purpose of this course is to provide students with theoretical knowledge and practical skills in the use of fertilizers, teaching them how to create the best conditions for plant nutrition using fertilizers, the peculiarities of their interaction with the soil, the correct composition of the system of application of fertilizers for individual crops

Learning Outcomes

ON3 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.

Prerequisites

Soil science Inorganic and organic chemistry

Postrequisites

Agricultural reclamation

Agroforestry

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31919 (3020135)
Course	3
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

It is aimed at studying the issues of design, creation and effective use of protective forest stands for various purposes in order to normalize the process of soil degradation. Considers the types of protective forest plantations, the influence of forest belts on the microclimate of the forested field, the totality of forestry measures aimed at improving the soil-hydrological and climatic conditions of the territory, the current state and prospects for the use of irrigated lands.

Purpose of studying of the discipline

The purpose of the discipline is the formation of theoretical knowledge and practical skills on the scientific and technological foundations of modern agroforestry.

Learning Outcomes

ON3 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.
ON7 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.

Prerequisites

Agrochemistry

Postrequisites

Reclamation agriculture

Chemical Reclamation

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31918 (3020134)
Course	3
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The course is aimed at studying measures to radically improve the chemical state and structure of soils with the help of special substances - chemical meliorants. The discipline covers a complex of reclamation measures to improve the chemical and physical qualities of soils; the current state and prospects for the use of irrigated lands; the concept of irrigation and irrigation systems, regimes, methods and techniques of irrigation of crops, methods of liming, gypsum and phosphorization of soils.

Purpose of studying of the discipline

Formation of knowledge on agrometeorology, irrigation reclamation, operation of reclamation systems, soil erosion and agroforestry and their use in professional activities for carrying out organizational, economic, technical, agrotechnical measures aimed at radically improving land, ensuring the sustainability and dynamism of agricultural production development, reducing its dependence on the influence of weather conditions.

Learning Outcomes

ON3 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.
ON7 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.

Prerequisites

Agrochemistry

Postrequisites

Reclamation agriculture

Agricultural reclamation

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31912 (3020075)
Course	3
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

It forms an idea of the branches of agricultural production, the main problem of which is considered to be the further increase in the fertility of the land, a steady increase in agricultural production based on the scientific use of irrigation and drainage, chemical land reclamation, 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 land, the essence of chemical, biological, irrigation and drainage reclamation and methods of their implementation; coverage of environmental issues, formation of ideas about the main types of reclamation, the need for reclamation work in Kazakhstan.

Learning Outcomes

ON7 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.

Prerequisites

Agrochemistry

Postrequisites

Reclamation agriculture

Module 4. Crop production

Forage production

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	31879 (3020076)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

Examines the basics of creating and strengthening the forage base on the basis of rational use and improvement of natural and field forage lands, information about the bioecological features of plants of hayfields and pastures, technology for improving forage lands. The discipline studies methods of determining the yield and nutritional value of feed, the process and methods of harvesting hay, silage and haylage; technology of feed preparation, determination of the quality of yield of fodder crops.

Purpose of studying of the discipline

Acquisition of knowledge about the patterns of development and life of forage plants, the relationship of plants with the environment, methods and techniques for creating optimal conditions for the growth of forage crops and obtaining feed based on them.

Learning Outcomes

ON5 Perform work on technologies to improve forage lands, fodder; to determine the methods and principles of activities on pastoral agriculture; to introduce advanced technologies of cultivation of agricultural crops taking into account biological features of plants.

Prerequisites

Phytobiology

Postrequisites

Meadows and pasture farming

Culture of plant cells

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31900 (3020078)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

Forms concepts about growing cells in special nutrient media, the basic principles of cultivation, the peculiarities of cell cultivation. The discipline includes: a brief history of plant cell cultivation, conditions of cell cultivation, callus production and cultivation, dedifferentiation and appearance of callus, heterogeneity of cultured cells, cell growth in cultures, as well as the use of cell cultures, plant cell cultures.

Purpose of studying of the discipline

To study the conditions of cell cultivation, humidification of the environment, humidification of the environment. Obtaining callus and its cultivation. The use of cell culture to solve theoretical and practical issues of agronomy, the technology of cell isolation and cultivation.

Learning Outcomes

ON2 To carry out the prediction of the phases of crop development, weather conditions, the influence of factors on yield and to properly use them in agriculture; to describe the morphological characteristics of plant organs; knowledge of the essence of physiological processes taking place in the plant cell, biological features.

ON11 To produce nutrient medium to cultivate cells; to identify the saprophytic and pathogenic microorganisms, use of products of microbial synthesis.

Prerequisites

Phytobiology

Postrequisites

Breeding and seed production of agricultural crops

The safety of transgenic plants

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31901 (3020079)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is aimed at studying the stages of obtaining transgenic plants, the history of the development of transgenic plants, methods of transformation of plant cells. It covers the issues of vectors for plant transformation based on plasmid, methods of agrobacteria cocultivation, plant cloning, obtaining a nutrient medium, stages of obtaining transgenic plants, the history of the development of transgenic plants, methods of transformation of plant cells, assessment of the environmental safety of transgenic plants.

Purpose of studying of the discipline
To study the method of transformation of plant cells. Vectors for plant transformation based on plasmid. The method of cultivation by agrobacteria. Cloning of plants. Obtaining a nutrient medium. Stages of obtaining transgenic plants, the history of the development of transgenic plants, methods of transformation of plant cells.

Learning Outcomes
ON11 To produce nutrient medium to cultivate cells; to identify the saprophytic and pathogenic microorganisms, use of products of microbial synthesis.

Prerequisites
Phytobiology

Postrequisites
Breeding and seed production of agricultural crops

Biotechnology crops

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31899 (3020077)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline includes theoretical questions and practical results in plant biotechnology related to obtaining forms with new improved features. Examines the application of biotechnology methods in crop breeding, seed production and cultivation technology, microbiology of cells and tissues cultivated in an artificial nutrient medium, clonal micro-separation and plant health, plant growth and formation regulators, the basic principles of genetic engineering, the use of invitro methods in plant breeding.

Purpose of studying of the discipline
To study the biology of cells and tissues cultivated in an artificial nutrient medium, clonal micro- reproduction and plant health improvement, regulators of plant growth and development

Learning Outcomes
ON11 To produce nutrient medium to cultivate cells; to identify the saprophytic and pathogenic microorganisms, use of products of microbial synthesis.

Prerequisites
Phytobiology

Postrequisites
Breeding and seed production of agricultural crops

The radical improvement of meadows and pastures

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31911 (3020108)

Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The course is aimed at studying the systems of indigenous and surface improvement of meadows and pastures, methods and techniques of their rational use. The discipline demonstrates the conditions necessary for carrying out radical improvement, methods of tinning, a set of measures - technical, meliorative and agrotechnical crops, the composition of grass mixtures. The description of the species composition of perennial grasses is given, taking into account the requirements for growing conditions in the main soil and vegetation zones.

Purpose of studying of the discipline

To study the biological features of forage crops and technologies of their cultivation in specific soil and climatic conditions. Types of feed. The concept of the fodder value of crops. Fundamentals of field and meadow forage production. Systems of their radical and superficial improvement, familiarization with methods and techniques of rational use of pastures and forage harvesting

Learning Outcomes

ON5 Perform work on technologies to improve forage lands, fodder; to determine the methods and principles of activities on pastoral agriculture; to introduce advanced technologies of cultivation of agricultural crops taking into account biological features of plants.

Prerequisites

Forage production

Postrequisites

Production practice 2

Meadows and pasture farming

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31909 (3020084)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The course is aimed at studying the construction and management of pasture farming, mastering the skills of technologies for growing grass and conducting meadow farming. The types of plants of natural hayfields and pastures, technologies of growing grass forage crops, methods and principles of pasture management measures, measures to improve forage lands are considered. The classification and inventory of natural forage lands, a brief description of the natural grasslands of meadows and pastures of natural zones of Kazakhstan are given.

Purpose of studying of the discipline

To study the management of pasture farming, mastering the skills of technologies for growing grass and conducting meadow farming

Learning Outcomes

ON5 Perform work on technologies to improve forage lands, fodder; to determine the methods and principles of activities on pastoral agriculture; to introduce advanced technologies of cultivation of agricultural crops taking into account biological features of plants.

Prerequisites

Forage production

Postrequisites

Production practice 2

Grassland forage production

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31910 (3020107)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours

Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
It is aimed at studying the system for growing cultured natural forage vegetation on the corresponding types of forage farmland to obtain a significant amount of pasture and stall feed per unit area. Explores the main constituent elements of grassland farming, biological and ecological foundations of grassland and pasture management, technologies of hay harvesting, the main natural zones and types of pastures and hayfields, ways to improve hayfields and pastures, rational use of pastures.

Purpose of studying of the discipline
To study the branches of forage production, types of feed, forage crops, rational use of forage lands and ways to increase their productivity

Learning Outcomes
ON5 Perform work on technologies to improve forage lands, fodder; to determine the methods and principles of activities on pastoral agriculture; to introduce advanced technologies of cultivation of agricultural crops taking into account biological features of plants.

Prerequisites
Forage production

Postrequisites
Production practice 2

Vegetable growing of the closed soil

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31915 (3020118)
Course	3
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is focused on the study of the technology of growing vegetables indoors, the development of modern methods of growing vegetable crops in greenhouse conditions, determining the needs of vegetable crops for heat, air, environment, humidity. The discipline includes: development of measures to combat diseases and pests of vegetable crops in the closed ground, increasing the economic efficiency of greenhouse production, increasing yields, volume and price of vegetable crops.

Purpose of studying of the discipline
To study the types of greenhouses and greenhouses. Modern models of greenhouses and greenhouses. Requirements of vegetable crops for heat, air, environment, humidity.

Learning Outcomes
ON8 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.

Prerequisites
Phytobiology

Postrequisites
Horticulture

Vegetable growing of open ground

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31916 (3020119)
Course	3
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is aimed at studying the technology of growing vegetables in the open ground, providing the population and the processing industry with vegetables, introducing the latest technologies for cultivating vegetable crops in open ground conditions, the influence of

environmental factors on the growth and development of vegetable crops. It covers the issues of drip irrigation technology, the use of zoned varieties, the use of materials for mulching, the use of a complex of fertilizers, chemical plant protection products.

Purpose of studying of the discipline

To study modern models of open ground. Requirements of vegetable crops for heat, air, environment, humidity. study their diseases and pests

Learning Outcomes

ON8 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.

Prerequisites

Phytobiology

Postrequisites

Horticulture

Greenhouses

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31917 (3020120)
Course	3
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline is aimed at studying the national economic significance of greenhouse farming. An idea is given about the types of greenhouses depending on seasonal use, about the constructions of greenhouses of frame, hangar type, about the types of modes in the greenhouse, about the observance of thermal, light modes. It includes: biological bases of vegetable growing and classification of vegetable crops, the concept of varietal and sowing qualities of vegetable seeds, cultivation of 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

ON8 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.

Prerequisites

Phytobiology

Postrequisites

Horticulture

Crop production

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	31920 (3020080)
Course	3
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

This course studies morphological and biological features of crop varieties, living conditions and cultivation techniques. The discipline reveals the theoretical foundations of plant productivity and crop formation, classification and characteristics of field crops, as well as cultivation technology. The practical part of the discipline is aimed at drawing up technological maps of cultivation of leading field crops, taking into account specific soil and climatic conditions of the area.

Purpose of studying of the discipline

To study the morphological and biological features and agricultural methods of cultivation of agricultural crops

Learning Outcomes

ON2 To carry out the prediction of the phases of crop development, weather conditions, the influence of factors on yield and to properly

use them in agriculture; to describe the morphological characteristics of plant organs; knowledge of the essence of physiological processes taking place in the plant cell, biological features.
ON4 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.

Prerequisites
Phytobiology

Postrequisites
Technology and storage of crop products

Adaptive plant-grower

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31940 (3020082)
Course	4
Term	1
Credits count	6
Lections	15hours
Practical and seminar classes	30hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	40hours
Independent work of the student	80hours
Total	180hours
Knowledge control form	Examination

Short description of discipline
It is aimed at the formation of theoretical knowledge and practical foundations of adaptive crop production, the 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
ON3 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.
ON4 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.

Prerequisites
Phytobiology

Postrequisites
Production practice 3

Vegetable growing

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31939 (3020083)
Course	4
Term	1
Credits count	6
Lections	15hours
Practical and seminar classes	30hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	40hours
Independent work of the student	80hours
Total	180hours
Knowledge control form	Examination

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
ON8 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use

the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.

Prerequisites

Phytobiology

Postrequisites

Horticulture

Horticulture

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31933 (3020081)
Course	4
Term	1
Credits count	6
Lections	15hours
Practical and seminar classes	30hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	40hours
Independent work of the student	80hours
Total	180hours
Knowledge control form	Examination

Short description of discipline

It focuses on the study of the cultivation of fruit and berry plants, zoned varieties and hybrids of vegetable and fruit crops, taking into account their biological characteristics. The importance of fruits and vegetable crops in the nutrition of mankind is revealed. The characteristics of fruit and vegetable crops, features of agricultural cultivation techniques, selection and seed production of fruit, berry and vegetable crops, methods of protection against diseases, harmful organisms, weed control, features of mechanization of work in fruit and vegetable growing are given.

Purpose of studying of the discipline

Study fruits, berries and vegetables in human nutrition. Classification of fruit, berry and vegetable crops. Agricultural techniques of cultivation.

Learning Outcomes

ON2 To carry out the prediction of the phases of crop development, weather conditions, the influence of factors on yield and to properly use them in agriculture; to describe the morphological characteristics of plant organs; knowledge of the essence of physiological processes taking place in the plant cell, biological features.

ON8 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.

Prerequisites

Phytobiology

Postrequisites

Production practice 3

Legislation in the field of crop production

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31930 (3020122)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

It is aimed at studying the theoretical and practical foundations of regulatory documents (government resolutions, technical regulations) necessary for agricultural specialists to work effectively in modern times. The main laws in the field of crop production are considered; requirements for the safety of crop production; rules for the implementation of varietal and seed control; rules for 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 students with a system of fundamental knowledge necessary for the subsequent preparation of a bachelor, 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.

Prerequisites

Bases of economics, law and ecological knowledge

Postrequisites

Pre-diploma practice

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

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31927 (3020123)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

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

ON4 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.

Prerequisites

Bases of economics, law and ecological knowledge

Postrequisites

Pre-diploma practice

Seed grower of vegetable cultures

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31936 (3020098)
Course	4
Term	1
Credits count	6
Lections	15hours
Practical and seminar classes	30hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	40hours
Independent work of the student	80hours
Total	180hours
Knowledge control form	Examination

Short description of discipline

It is aimed at studying the characteristics of the sowing and planting material of plants, varietal and sowing qualities of vegetable seeds. The main reasons for the change of varietal properties in the process of reproduction of species, methods of improving the properties of seeds, technologies for the production and storage of seeds of individual crops, issues of organization of seed production of vegetable crops, variety exchange and variety renewal, creation of elite seeds, the impact of environmental, agrotechnical conditions on the yield and quality of seeds of vegetable plants are considered.

Purpose of studying of the discipline

To acquaint students with modern methods and techniques of seed production. To analyze new progressive techniques for obtaining high yields of high-quality seeds of their harvesting, refinement and processing.

Learning Outcomes

ON6 Develop systems of measures for plant protection; conduct surveys of agricultural land for pests and diseases of crops, identify the main types of pests and diseases; to carry out all types of breeding works taking into account the basic laws of genetics; to determine varietal and sowing qualities of seeds.

Prerequisites

Fundamentals of scientific research in agronomy

Postrequisites

Pre-diploma practice Production practice 3

Standardization and certification of crop production

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31931 (3020121)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

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 a general description of standards of different categories and types, a general description 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

ON4 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.

Prerequisites

Bases of economics, law and ecological knowledge

Postrequisites

Pre-diploma practice

Technology and storage of crop products

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	31926 (3020130)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The course is aimed at studying problems related to the quality of crop production and ways to improve them, the nature of losses of these products and the organization of their storage, rational methods of processing and storage of agricultural raw materials. The discipline considers questions about the vital activity of pathogens, insects and ticks in plant raw materials and the harm caused by them, and control measures. The material on flour milling, bakery and canning industries is demonstrated.

Purpose of studying of the discipline

The purpose of this course is to study the basics of the theory and practice of storage of agricultural products, as well as training specialists and managers of agriculture in the field of technology of storage and processing of agricultural products.

Learning Outcomes

ON4 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.

Prerequisites

Crop production

Postrequisites

Production practice 3

Module 5. Plant protection and breeding

The basics of pathology

Discipline cycle	Basic disciplines
Discipline component	Electives

SubjectID	31877 (3020132)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline includes the study of the pathological process resulting from the interaction of the pathogen and the host plant. Examines anatomical and morphological changes in plants, physiological and biochemical disorders that occur in a plant affected by pathogens; the mechanism of action of the pathogen on plant cells by enzymes, toxins and other biologically active substances, the nature of the symptoms of the disease, growth disorders, changes in the shape of the entire plant or some of its organs, the structure and structure of tissues.

Purpose of studying of the discipline
Students receive professional training in the field of diagnostics of plant diseases, biological damage.and the organization of protective measures. Study of patterns of development and spread of plant diseases

Learning Outcomes
ON6 Develop systems of measures for plant protection; conduct surveys of agricultural land for pests and diseases of crops, identify the main types of pests and diseases; to carry out all types of breeding works taking into account the basic laws of genetics; to determine varietal and sowing qualities of seeds.

Prerequisites
Phytobiology

Postrequisites
Protection of crops from pests and diseases

General phytopathology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31875 (3020086)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Formation of the basic concepts of plant diseases and causes. Considers the diagnosis of plant diseases, the basic ideas about the symptoms of diseases, the classification of plant diseases, the basics of biology and taxonomy of phytopathogenic fungi; features of biology and ecology of biological agents that cause plant diseases; main sources of plant infection; plant pathology, general patterns of development and spread of plant diseases; organization of protective measures against plant diseases.

Purpose of studying of the discipline
formation of knowledge and Skills in the biology of plant disease pathogens and their diagnosis.

Learning Outcomes
ON6 Develop systems of measures for plant protection; conduct surveys of agricultural land for pests and diseases of crops, identify the main types of pests and diseases; to carry out all types of breeding works taking into account the basic laws of genetics; to determine varietal and sowing qualities of seeds.

Prerequisites
Phytobiology

Postrequisites
Protection of crops from pests and diseases

Agricultural Phytopathology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31878 (3020133)
Course	1
Term	2

Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
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. Special 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
ON6 Develop systems of measures for plant protection; conduct surveys of agricultural land for pests and diseases of crops, identify the main types of pests and diseases; to carry out all types of breeding works taking into account the basic laws of genetics; to determine varietal and sowing qualities of seeds.

Prerequisites
Phytobiology

Postrequisites
Protection of crops from pests and diseases

Pests of agricultural crops

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31883 (3020089)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is aimed at studying about pests of agricultural plants. Examines the biology of agricultural pests, methods against harmful organisms, protection of crops from harmful organisms. It includes quarantine, agrotechnical, biochemical, sanitary - preventive, physical and mechanical measures against harmful organisms of agricultural plants, damage caused by pests to crop yields and measures to protect crops from their mass development.

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
ON6 Develop systems of measures for plant protection; conduct surveys of agricultural land for pests and diseases of crops, identify the main types of pests and diseases; to carry out all types of breeding works taking into account the basic laws of genetics; to determine varietal and sowing qualities of seeds.

Prerequisites
Agricultural Phytopathology

Postrequisites
Protection of crops from pests and diseases

Genetic

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	31880 (3020085)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours

Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline introduces the basics of heredity and variability of organisms, the main provisions of genetics, Mendel`s laws, the chromosomal theory of heredity. Gives an idea of the cytological foundations of heredity, the patterns of inheritance in remote and intraspecific hybridization. Examines the provisions on the molecular foundations of heredity, the main types of variability, polyploidy and its role in breeding and evolution, genetic evaluation of populations and individuals by offspring.

Purpose of studying of the discipline

The purpose of this course is to ensure the disclosure of the content of the basic principles, laws and concepts of each section of the course and the development of genetic thinking skills for conscious perception and mastering the methods of genetics.

Learning Outcomes

ON6 Develop systems of measures for plant protection; conduct surveys of agricultural land for pests and diseases of crops, identify the main types of pests and diseases; to carry out all types of breeding works taking into account the basic laws of genetics; to determine varietal and sowing qualities of seeds.

Prerequisites

School course

Postrequisites

Production practice 1

General entomology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31882 (3020088)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

Overview of agricultural pests. The study of biology / x pests. Methods against a / x pests. Protection from / crops from pests. Methods for protecting plants from pests: quarantine of plants, agronomic, biological, chemical, organizational and economic measures. Faunal assemblages pests of major crops and the system of measures to combat them.

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

ON6 Develop systems of measures for plant protection; conduct surveys of agricultural land for pests and diseases of crops, identify the main types of pests and diseases; to carry out all types of breeding works taking into account the basic laws of genetics; to determine varietal and sowing qualities of seeds.

Prerequisites

Agricultural Phytopathology

Postrequisites

Protection of crops from pests and diseases

Agricultural entomology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31881 (3020087)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
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

ON6 Develop systems of measures for plant protection; conduct surveys of agricultural land for pests and diseases of crops, identify the main types of pests and diseases; to carry out all types of breeding works taking into account the basic laws of genetics; to determine varietal and sowing qualities of seeds.
ON8 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.

Prerequisites

Agricultural Phytopathology

Postrequisites

Protection of crops from pests and diseases

Biological basis of crop protection

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31891 (3020091)
Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The concept of the biological basis of crop production. The main crop culture. Biological features of agricultural crops. Know the biological characteristics of crops. Favorable conditions for growth and development of plants. The technology of cultivation of crops taking into account the biological characteristics of the plants

Purpose of studying of the discipline

to study the biological features of plant growth and development depending on environmental factors

Learning Outcomes

ON4 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.
ON5 Perform work on technologies to improve forage lands, fodder; to determine the methods and principles of activities on pastoral agriculture; to introduce advanced technologies of cultivation of agricultural crops taking into account biological features of plants.

Prerequisites

Agricultural entomology Agricultural Phytopathology

Postrequisites

Crop production

Protection of crops from pests and diseases

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31890 (3020090)
Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

Theoretical knowledge of the material nature, causes and development of diseases, biological characteristics of pests and to instill skills and abilities to identify, alarm, predict, control measures and prevent the development and spread of diseases and pests.

Purpose of studying of the discipline

The purpose of this discipline is to master students` knowledge, skills and abilities to identify diseases and pests of agricultural plants, prevent plant diseases and measures to combat diseases and pests of agricultural plants.

Learning Outcomes
ON6 Develop systems of measures for plant protection; conduct surveys of agricultural land for pests and diseases of crops, identify the main types of pests and diseases; to carry out all types of breeding works taking into account the basic laws of genetics; to determine varietal and sowing qualities of seeds.
Prerequisites
Agricultural entomology Agricultural Phytopathology
Postrequisites
Crop production

Phytopathology with immune system

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31885 (3020138)
Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Basic understanding of the symptoms of diseases, environmental factors and parasitic organisms that cause plant diseases, the immunity of plants to diseases. principles of plant resistance to diseases. Type of relationship between parasite and plants. Organization of protective measures against plant diseases, measures to improve plant resistance to diseases.
Purpose of studying of the discipline
formation of knowledge and skills in the biology of plant pathogens and their diagnostics. about the immunity of plants to diseases. principles of plant resistance to diseases.
Learning Outcomes
ON2 To carry out the prediction of the phases of crop development, weather conditions, the influence of factors on yield and to properly use them in agriculture; to describe the morphological characteristics of plant organs; knowledge of the essence of physiological processes taking place in the plant cell, biological features.
ON6 Develop systems of measures for plant protection; conduct surveys of agricultural land for pests and diseases of crops, identify the main types of pests and diseases; to carry out all types of breeding works taking into account the basic laws of genetics; to determine varietal and sowing qualities of seeds.
Prerequisites
Agricultural entomology Agricultural Phytopathology
Postrequisites
Crop production

Biological protection of plants

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31904 (3020109)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
It is aimed at studying methods and principles of measures to combat plant diseases and pests using biological objects - entomophages, herbifages, pathogens and antagonists of the most important pests, weeds and pathogens of agricultural crops. It 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

ON8 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.

Prerequisites

Protection of crops from pests and diseases

Postrequisites

Plant quarantine

Integrated plant protection

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31902 (3020092)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

This discipline is aimed at studying the management system of the phytosanitary state of ecosystems, the complex application of various means and measures of plant protection. Evaluates the provision of phytosanitary well-being of the area and sustainable long-term suppression of the number of harmful organisms, regulation of the phytosanitary condition of crops, cultivation of resistant highly productive varieties, activation of natural entomophages and acariphages, the use of biological methods and optimal use of pesticides and innovative means of 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

ON8 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.

Prerequisites

Protection of crops from pests and diseases

Postrequisites

Plant quarantine

Chemical protection of plants

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31903 (3020093)
Course	3
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
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

ON3 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.

Prerequisites

Protection of crops from pests and diseases

Postrequisites

Plant quarantine

Production practice 2

Discipline cycle	Basic disciplines

Discipline component	University component
SubjectID	31914 (3020103)
Course	3
Term	2
Credits count	5
Working practice	150hours
Total	150hours
Knowledge control form	Total mark on practice

Short description of discipline
During the internship, the student consolidates the knowledge gained in the process of studying the disciplines of the basic, variable and profile parts; develop practical skills; get acquainted with modern
equipment. Acquires skills: carrying out basic and pre-sowing tillage, organizing and carrying out sowing of agricultural crops, carrying out technological techniques for caring for crops and planting agricultural crops,
carrying out protective measures against harmful organisms (weeds, pests and diseases), organizing and carrying out harvesting of agricultural crops, primary processing of crop production and laying it for storage.

Purpose of studying of the discipline
The purpose of industrial practice 2 is to consolidate professional competencies, acquire practical skills in production

Learning Outcomes
ON4 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.

Prerequisites
Educational practice

Postrequisites
Production practice 3

Breeding and seed production of agricultural crops

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	31913 (3020094)
Course	3
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is aimed at studying the breeding process in crop production, hybridization techniques, crossing techniques; testing of crops; filling out documentation for varietal crops. The issues of organization of primary seed production and improvement of varieties in the process of primary seed production are considered; cultivation of elite varieties of cereals, legumes; cultivation of seeds of fertile and sterile analogues of the corn line; cultivation of virus- free elite potatoes using clone selection; varietal characteristics of the most significant crops.

Purpose of studying of the discipline
To study the selection process in crop production, methods and techniques of selection, evaluation of breeding material, varietal control

Learning Outcomes
ON2 To carry out the prediction of the phases of crop development, weather conditions, the influence of factors on yield and to properly use them in agriculture; to describe the morphological characteristics of plant organs; knowledge of the essence of physiological processes taking place in the plant cell, biological features.
ON6 Develop systems of measures for plant protection; conduct surveys of agricultural land for pests and diseases of crops, identify the main types of pests and diseases; to carry out all types of breeding works taking into account the basic laws of genetics; to determine varietal and sowing qualities of seeds.

Prerequisites
Genetic

Postrequisites
Methods of agricultural crops variety testing

Plant quarantine

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31935 (3020099)
Course	4
Term	1
Credits count	5

Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Plant quarantine occupies a definite place among other agronomical disciplines, therefore, students should be given high- quality Knowing in this discipline. in particular, on the basis of theoretical training and practical skills in identifying, localizing and eliminating quarantine objects, as well as preventing their entry into regions of the Republic of Kazakhstan where they are absent.

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
ON6 Develop systems of measures for plant protection; conduct surveys of agricultural land for pests and diseases of crops, identify the main types of pests and diseases; to carry out all types of breeding works taking into account the basic laws of genetics; to determine varietal and sowing qualities of seeds.

Prerequisites
Protection of crops from pests and diseases

Postrequisites
Production practice 3

Breeding and seed production of agricultural crops

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31928 (3020128)
Course	4
Term	1
Credits count	6
Lections	15hours
Practical and seminar classes	30hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	40hours
Independent work of the student	80hours
Total	180hours
Knowledge control form	Examination

Short description of discipline
It is aimed at studying anatomical, morphological features of seeds of agricultural crops, phases of development, chemical composition of seeds, distribution of fruits and seeds, methods for determining the quality of seed material, seed purity, laboratory germination and seed germination energy, yield properties of seeds. Analyzes the process of seed formation, the physiology of the resting seed, respiration and post-harvest maturation of seeds, the influence of environmental, agrotechnical factors on the yield and quality of seeds.

Purpose of studying of the discipline
To study seeds and fruits of agricultural crops, their formation and maturation.

Learning Outcomes
ON6 Develop systems of measures for plant protection; conduct surveys of agricultural land for pests and diseases of crops, identify the main types of pests and diseases; to carry out all types of breeding works taking into account the basic laws of genetics; to determine varietal and sowing qualities of seeds.

Prerequisites
Fundamentals of scientific research in agronomy

Postrequisites
Pre-diploma practice Production practice 3

Signaling and forecasting the development of pests and diseases of agricultural crops

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31925 (3020113)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours

Total	150hours
Knowledge control form	Examination

Short description of discipline

Forms a general concept of the forecast, the role of the forecast of the spread and development of harmful organisms, the history of the development of the forecast service. Considers the forms of forecasts of the phytosanitary situation and signaling of the timing of control of diseases and pests of plants used in plant protection, the theoretical foundations of the development of forecasts, the principles of the organization of work on diagnostics, forecasting the spread of pests and diseases of crops and signaling the timing of control.

Purpose of studying of the discipline

To teach students to build complex 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 biotic and abiotic factors.

Learning Outcomes

ON6 Develop systems of measures for plant protection; conduct surveys of agricultural land for pests and diseases of crops, identify the main types of pests and diseases; to carry out all types of breeding works taking into account the basic laws of genetics; to determine varietal and sowing qualities of seeds.

Prerequisites

Protection of crops from pests and diseases

Postrequisites

Production practice 3

Diagnostics of quarantine organisms and control measures

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31932 (3020114)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

Forms the concept of diagnostic methods of quarantine organisms that are widespread and have quarantine significance for the territory of the Republic of Kazakhstan. Considers bioecological and morphological features necessary for the identification of quarantine types of diseases and pests. Information is given about the area of distribution, the nature of harmfulness, methods of diagnosis, detection and identification, phytosanitary measures and measures to combat these harmful organisms and the basics of quarantine disinfection.

Purpose of studying of the discipline

Formation of knowledge and skills to protect the plant resources of Kazakhstan from importation from foreign countries and the spread of quarantine and other particularly dangerous harmful organisms.

Learning Outcomes

ON6 Develop systems of measures for plant protection; conduct surveys of agricultural land for pests and diseases of crops, identify the main types of pests and diseases; to carry out all types of breeding works taking into account the basic laws of genetics; to determine varietal and sowing qualities of seeds.

Prerequisites

Protection of crops from pests and diseases

Postrequisites

Production practice 3

Methods of agricultural crops variety testing

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31937 (3020097)
Course	4
Term	1
Credits count	6
Lections	15hours
Practical and seminar classes	30hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	40hours
Independent work of the student	80hours
Total	180hours

Knowledge control form	Examination

Short description of discipline
Introduces the general provisions of the state variety testing, the organization of the territory of the state variety site, the planning of variety testing, the main provisions of setting small- scale experiments, the study of elements of varietal technology, the features of testing varieties on reclaimed lands, production testing of varieties, observations and accounting during the growing season, harvesting and crop accounting. Concepts are given about seed and planting material, about the technology of production of crop products and agrotechnics of variety testing, about the immunological assessment of varieties and hybrids.

Purpose of studying of the discipline
To study the general provisions of the state variety testing, planning of variety testing, the main provisions of setting small- scale experiments, elements of varietal technology, seed and planting material, laying and registration of experiments, observations and records during the growing season, harvesting and crop accounting.

Learning Outcomes
ON6 Develop systems of measures for plant protection; conduct surveys of agricultural land for pests and diseases of crops, identify the main types of pests and diseases; to carry out all types of breeding works taking into account the basic laws of genetics; to determine varietal and sowing qualities of seeds.

Prerequisites
Fundamentals of scientific research in agronomy

Postrequisites
Pre-diploma practice Production practice 3

Module 6. Farming systems

Methods of scientific research in vegetable growing

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31896 (3020126)
Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The methods and main stages of conducting field and research work in agronomy are considered. It includes the basic concepts and classification of research methods, the main elements of the methodology of field experience; generalization, systematization, analysis of experimental materials and evaluation of the results of the experiment. The generalized material on the organization, methodology and technique of field experience in an industrial environment, recommendations on the principles of planning observations and analyses taking into account the soil and climatic conditions of the research area are given.

Purpose of studying of the discipline
To study the theoretical foundations of conducting research; to study the principles of methods of setting up experience; to master the methodology of the economic efficiency of the results of experience

Learning Outcomes
ON8 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.
ON9 To conduct field research experiments, to argue the results of research, to prepare all kinds of scientific works.

Prerequisites
Introduction to the specialty

Postrequisites
Methods of agricultural crops variety testing

Field experiment technique

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31894 (3020110)
Course	2
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The methods and main stages of conducting field and research work in agronomy are considered. It includes the basic concepts and classification of research methods, the main elements of the methodology of field experience; generalization, systematization, analysis of experimental materials and evaluation of the results of the experiment. The generalized material on the organization, methodology and technique of field experience in an industrial environment, recommendations on the principles of planning observations and analyses taking into account the soil and climatic conditions of the research area are given.
Purpose of studying of the discipline
to teach students to plan and conduct agricultural experiments, observations and accounting in conducted experiments
Learning Outcomes
ON7 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.
ON9 To conduct field research experiments, to argue the results of research, to prepare all kinds of scientific works.
Prerequisites
Introduction to the specialty
Postrequisites
Methods of agricultural crops variety testing

Agriculture

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	31921 (3020095)
Course	3
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	15hours
Laboratory works	15hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline is aimed at studying theoretical and practical issues of agriculture, including the intensification of the living conditions of agricultural plants, a set of measures against weeds, crop rotations, precursors and methods, methods of soil treatment, the principles of biologization, ecologization of agriculture and the prerequisites of the agro-landscape approach in modern farming systems are also considered. The issues of improving soil fertility and general problems of growing crops are highlighted.
Purpose of studying of the discipline
to give students in this discipline deep and high-quality knowledge. in particular, on the basis of theoretical training and practical skills in the implementation of a system of agrotechnical measures, the reproduction of effective soil fertility - as the main means of production, through weed control, management and development of crop rotations, proper tillage system
Learning Outcomes
ON2 To carry out the prediction of the phases of crop development, weather conditions, the influence of factors on yield and to properly use them in agriculture; to describe the morphological characteristics of plant organs; knowledge of the essence of physiological processes taking place in the plant cell, biological features.
ON3 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.
Prerequisites
Soil science
Postrequisites
Agrolandscape farming system

Reclamation agriculture

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31924 (3020115)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Studies the effects of land reclamation works on the environment; rational use of land and water resources; development of irrigation

regime depending on the type of crops; proper use of irrigation equipment; control and improvement of the reclamation condition of irrigated territories, a set of organizational, economic and technical measures to improve the quality of hydrological, soil and agro-climatic criteria, increasing the productivity of land and water resources in order to obtain high and stable yields of agricultural crops.

Purpose of studying of the discipline

The purpose of this course is to familiarize with the methods of reclamation treatment and its impact on fertility, on the phytosanitary condition of the soil, on crop yields.

Learning Outcomes

ON7 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.

Prerequisites

Agricultural reclamation

Postrequisites

Production practice 3

Irrigation farming systems

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31922 (3020131)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The course studies irrigation systems and its elements, irrigation methods, the influence of the irrigation system on soil fertility. Surface methods of irrigation of agricultural crops, irrigation by sprinkling, methods of combating soil salinization during irrigation are considered. Information is given on the operation of irrigation systems, the formation of swamps and waterlogging of lands, types of water supply, methods and methods of drainage of swamps and waterlogging of lands.

Purpose of studying of the discipline

The purpose of this course is to familiarize with the types of irrigation systems and its elements, irrigation methods, methods and methods of drainage and waterlogging of land.

Learning Outcomes

ON7 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.

Prerequisites

Agricultural reclamation

Postrequisites

Production practice 3

Irrigated agriculture

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	31923 (3020111)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline forms the concepts of biological and agrotechnical foundations of irrigated agriculture, basic information about irrigation systems and its elements, methods of surface irrigation of crops, installation of sprinkler units. Studies issues on the implementation of measures to combat soil salinity during irrigation, on the state of water resources and their transboundary nature, on ways to preserve soil fertility with the mandatory introduction of crop rotation of agricultural crops.

Purpose of studying of the discipline

To study the features of irrigation in various agricultural zones, types and methods of irrigation, features of cultivation of agricultural crops during irrigation.

Learning Outcomes

ON7 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use

the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.

Prerequisites

Agricultural reclamation

Postrequisites

Production practice 3

Agrolandscape farming system

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31938 (3020096)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

This course focuses on the study of the regulation of key indicators and systems for the formation of agroecosystems in agro-landscape agriculture, compliance of agro- landscape agriculture with the requirements of nature protection and the system of environmental restrictions. The discipline includes: scientific concepts of the formation of agro-landscape agriculture, concepts and criteria for the development of aerolandscape agriculture, systematization of natural landscapes and agro-landscapes, promising goals of integrating agriculture to technogenic circumstances.

Purpose of studying of the discipline

To study the ways and methods of human influence on direct and indirect changes in natural landscapes, their use for the development of agriculture

Learning Outcomes

ON4 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.
ON7 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.

Prerequisites

Agriculture

Postrequisites

Production practice 3

Rainfed agriculture

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31934 (3020112)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline is aimed at studying the development and improvement of tillage techniques on rainfed lands, classification of rainfed lands. The discipline considers the system of agriculture and the features of the water balance of the soil on the bogar, the agrotechnical significance of the fallow field on the bogar, the snow-accumulating role of stubble in flat-cut tillage, the influence of the methods of main and summer steam treatment on semi-secured bogar, the influence of winter tillage on the elements of soil fertility.

Purpose of studying of the discipline

familiarization of students with the factoriality of agriculture, laws and ecological principles is a theoretical basis as about the general laws for optimizing the factors of plant life for the formation of a high yield, preservation and improvement of soil fertility and a systematic approach to agriculture

Learning Outcomes

ON7 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.

Prerequisites

Agriculture

Postrequisites

Production practice 3

Precision farming basics

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31929 (3020129)
Course	4
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The course is focused on research on increasing the profitability of agricultural production by obtaining high yields and high-quality crop production products while reducing production costs and reducing the environmental burden on agroecosystems using digital methods and geoinformation systems. The general knowledge of traditional and adaptive landscape farming and the latest approaches of the current achievements of crop automation are considered.

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 Rate Technology (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

ON2 To carry out the prediction of the phases of crop development, weather conditions, the influence of factors on yield and to properly use them in agriculture; to describe the morphological characteristics of plant organs; knowledge of the essence of physiological processes taking place in the plant cell, biological features.
ON3 To develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.

Prerequisites

Agriculture

Postrequisites

Production practice 3

Pre-diploma practice

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31871 (3020101)
Course	4
Term	2
Credits count	15
Undergraduate practice	450hours
Total	450hours
Knowledge control form	Total mark on practice

Short description of discipline

Pre-graduate practice is an integral part of the student training program. The main content of the practice is the implementation of practical educational, creative tasks corresponding to the nature of future professional activity, preparation of the final qualifying work, the passage of pre–graduate practice is an opportunity for a student to demonstrate to a potential employer the level of his theoretical training in the specialty received at a university or secondary vocational educational institution, as well as to prepare for writing a thesis.

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 develop technological maps of cultivation of agricultural crops taking into account soil and climatic conditions and biological features of agricultural crops; to prove a method of harvesting of crops, primary processing of crop production and its laying on storage.
ON6 Develop systems of measures for plant protection; conduct surveys of agricultural land for pests and diseases of crops, identify the main types of pests and diseases; to carry out all types of breeding works taking into account the basic laws of genetics; to determine varietal and sowing qualities of seeds.
ON9 To conduct field research experiments, to argue the results of research, to prepare all kinds of scientific works.

Prerequisites

Production practice 2

Postrequisites

Final examination

Production practice 3

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	31941 (3020104)
Course	4
Term	2
Credits count	15
Working practice	450hours
Total	450hours
Knowledge control form	Total mark on practice

Short description of discipline

During the internship, the student consolidates the knowledge gained in the process of studying the disciplines of the basic, variable and profile parts; develop practical skills; get acquainted with modern equipment. Acquires skills: carrying out basic and pre-sowing tillage, organizing and carrying out sowing of agricultural crops, carrying out technological techniques for caring for crops and plantings of agricultural crops. carrying out protective measures against harmful organisms (weeds, pests and diseases), organizing and carrying out harvesting of agricultural crops, primary processing of crop production and laying it for storage.

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

ON6 Develop systems of measures for plant protection; conduct surveys of agricultural land for pests and diseases of crops, identify the main types of pests and diseases; to carry out all types of breeding works taking into account the basic laws of genetics; to determine varietal and sowing qualities of seeds.
ON8 To use methods and principles of measures for biological control of diseases and pests of plants, to plant biological objects; to use the technology of cultivation of vegetable crops in open and protected grounds; scheduling of the work in greenhouses and greenhouses.
ON11 To produce nutrient medium to cultivate cells; to identify the saprophytic and pathogenic microorganisms, use of products of microbial synthesis.

Prerequisites

Production practice 2

Postrequisites

Final examination

Final examination

Writing and defending a thesis or preparing and passing a comprehensive exam.

Diploma work

Credits count	8

Final examination

Credits count	8

4.Summary table on the scope of the educational program

«6B08101 - Agronomy»

Name of discipline	Cycle/ Component	Term	Number of credits	Total hours	Lec	SPL	LC	IWST	IWS	Knowledge control form
Module 1. Fundamentals of social and humanitarian knowledge										
Foreign language	GER/CC	1	5	150		45		35	70	Examination
History of Kazakhstan	GER/CC	1	5	150	30	15		35	70	Qualification examination
Kazakh language	GER/CC	1	5	150		45		35	70	Examination
Bases of economics, law and ecological knowledge	GER/US	1	5	150	15	30	0	35	70	Examination
Russian language	GER/CC	1	5	150		45		35	70	Examination
Physical Culture	GER/CC	1	2	60		60				Differentiated attestation
Kazakh language	GER/CC	2	5	150		45		35	70	Examination
Foreign language	GER/CC	2	5	150		45		35	70	Examination
The module of socio-political knowledge (sociology, political science, cultural studies, psychology)	GER/CC	2	8	240	30	45		55	110	Examination
Russian language	GER/CC	2	5	150		45		35	70	Examination
Physical Culture	GER/CC	2	2	60		60				Differentiated attestation
Information and communication technology	GER/CC	3	5	150	15	15	15	35	70	Examination
Physical Culture	GER/CC	3	2	60		60				Differentiated attestation
World of Abai	BS/US	3	3	90	15	15		20	40	Examination
Physical Culture	GER/CC	4	2	60		60				Differentiated attestation
Philosophy	GER/CC	5	5	150	15	30		35	70	Examination
Module 3. Natural Science										
Phytobiology	BS/US	1	5	150	15	15	15	35	70	Examination
Introduction to the specialty	BS/US	1	3	90	15	15		20	40	Examination
Agrometerology	BS/US	2	3	90	15	15		20	40	Examination
Educational practice	BS/US	2	2	60						Total mark on practice
Inorganic and organic chemistry	BS/US	3	3	90	15		15	20	40	Examination
Fundamentals of scientific research in agronomy	BS/CCh	4	5	150	15	30		35	70	Examination
Digitalization in agronomy	BS/US	4	5	150	15	30		35	70	Examination
Module 31.Soil reclamation										
The Parking management in agriculture	BS/CCh	4	5	150	15	15	15	35	70	Examination

Soil science	BS/US	4	5	150	15	15	15	35	70	Examination
Production practice 1	BS/US	4	5	150						Total mark on practice
Agricultural machinery	BS/CCh	4	5	150	15	15	15	35	70	Examination
Exploitation of machine-tractor Park	BS/CCh	4	5	150	15	15	15	35	70	Examination
Appraisal and classification of soils	BS/CCh	5	5	150	15	30		35	70	Examination
Agro soil science	BS/CCh	5	5	150	15	15	15	35	70	Examination
Agrochemistry	BS/CCh	5	5	150	15	15	15	35	70	Examination
Bonitization and qualitative assessment of soils	BS/CCh	5	5	150	15	30		35	70	Examination
Soil and plant diagnostics	BS/CCh	5	5	150	15	30		35	70	Examination
Technology is the use of fertilizers	BS/CCh	5	5	150	15	15	15	35	70	Examination
Agroforestry	BS/CCh	6	5	150	15	30		35	70	Examination
Chemical Reclamation	BS/CCh	6	5	150	15	30		35	70	Examination
Agricultural reclamation	BS/CCh	6	5	150	15	30		35	70	Examination
Module 4. Crop production										
Forage production	BS/US	3	5	150	15	15	15	35	70	Examination
Culture of plant cells	BS/CCh	5	5	150	15	15	15	35	70	Examination
The safety of transgenic plants	BS/CCh	5	5	150	15	15	15	35	70	Examination
Biotechnology crops	BS/CCh	5	5	150	15	15	15	35	70	Examination
The radical improvement of meadows and pastures	AS/CCh	5	5	150	15	30		35	70	Examination
Meadows and pasture farming	AS/CCh	5	5	150	15	30		35	70	Examination
Grassland forage production	AS/CCh	5	5	150	15	30		35	70	Examination
Vegetable growing of the closed soil	BS/CCh	6	5	150	15	30		35	70	Examination
Vegetable growing of open ground	BS/CCh	6	5	150	15	30		35	70	Examination
Greenhouses	BS/CCh	6	5	150	15	30		35	70	Examination
Crop production	AS/US	6	5	150	15	15	15	35	70	Examination
Adaptive plant-grower	AS/CCh	7	6	180	15	30	15	40	80	Examination
Vegetable growing	AS/CCh	7	6	180	15	30	15	40	80	Examination
Horticulture	AS/CCh	7	6	180	15	30	15	40	80	Examination
Legislation in the field of crop production	AS/CCh	7	5	150	15	30		35	70	Examination
Estimation and setting of norms of quality of plant-grower products	AS/CCh	7	5	150	15	30		35	70	Examination
Seed grower of vegetable cultures	AS/CCh	7	6	180	15	30	15	40	80	Examination
Standardization and certification of crop production	AS/CCh	7	5	150	15	30		35	70	Examination
Technology and storage of crop products	AS/US	7	5	150	15	30		35	70	Examination
Module 5. Plant protection and breeding										

The basics of pathology	BS/CCh	2	5	150	15	15	15	35	70	Examination
General phytopathology	BS/CCh	2	5	150	15	15	15	35	70	Examination
Agricultural Phytopathology	BS/CCh	2	5	150	15	15	15	35	70	Examination
Pests of agricultural crops	BS/CCh	3	5	150	15	15	15	35	70	Examination
Genetic	BS/US	3	5	150	15	15	15	35	70	Examination
General entomology	BS/CCh	3	5	150	15	15	15	35	70	Examination
Agricultural entomology	BS/CCh	3	5	150	15	15	15	35	70	Examination
Biological basis of crop protection	BS/CCh	4	5	150	15	15	15	35	70	Examination
Protection of crops from pests and diseases	BS/CCh	4	5	150	15	15	15	35	70	Examination
Phytopathology with immune system	BS/CCh	4	5	150	15	15	15	35	70	Examination
Biological protection of plants	BS/CCh	5	5	150	15	30		35	70	Examination
Integrated plant protection	BS/CCh	5	5	150	15	30		35	70	Examination
Chemical protection of plants	BS/CCh	5	5	150	15	30		35	70	Examination
Production practice 2	BS/US	6	5	150						Total mark on practice
Breeding and seed production of agricultural crops	BS/US	6	5	150	15	15	15	35	70	Examination
Plant quarantine	AS/CCh	7	5	150	15	15	15	35	70	Examination
Breeding and seed production of agricultural crops	AS/CCh	7	6	180	15	30	15	40	80	Examination
Signaling and forecasting the development of pests and diseases of agricultural crops	AS/CCh	7	5	150	15	15	15	35	70	Examination
Diagnostics of quarantine organisms and control measures	AS/CCh	7	5	150	15	15	15	35	70	Examination
Methods of agricultural crops variety testing	AS/CCh	7	6	180	15	30	15	40	80	Examination
Module 6. Farming systems										
Methods of scientific research in vegetable growing	BS/CCh	4	5	150	15	30		35	70	Examination
Field experiment technique	BS/CCh	4	5	150	15	30		35	70	Examination
Agriculture	AS/US	6	5	150	15	15	15	35	70	Examination
Reclamation agriculture	BS/CCh	7	5	150	15	30		35	70	Examination
Irrigation farming systems	BS/CCh	7	5	150	15	30		35	70	Examination
Irrigated agriculture	BS/CCh	7	5	150	15	30		35	70	Examination
Agrolandscape farming system	AS/CCh	7	5	150	15	30		35	70	Examination
Rainfed agriculture	AS/CCh	7	5	150	15	30		35	70	Examination
Precision farming basics	AS/CCh	7	5	150	15	30		35	70	Examination
Pre-diploma practice	AS/CCh	8	15	450						Total mark on practice
Production practice 3	AS/CCh	8	15	450						Total mark on practice
Final examination										

Diploma work		8	8	240						
Final examination		8	8	240						