CATALOG OF ELECTIVE DISCIPLINES

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

6B083 - Forestry
(Code and classification of the direction of training)

0821
(Code in the International Standard Classification of Education)

B079 - Forest resources and forestry
(Code and classification of the educational program group)

6B08303 - Forest resources and hunting
(Code and name of the educational program)

bachelor
(Level of preparation)

set of 2023

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Developed
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Reviewed
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Chairman of the Commission Jamanova G.

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Chairman of the Academic Council Oralkanova I.

Pre-graduate practice

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

Short description of discipline
Progressive forms of labor organization. Methodology, technique of analysis of the production activity of the farm, its specialization in the industry, economic assessment of technological, organizational measures. Achievements of science, digitalization, in the field of forestry. The moral, psychological situation in the workforce. Independent planning, solution of production tasks with the involvement of modern technical means.

Purpose of studying of the discipline
The purpose of the pre-graduate internship is to master the skills of managing divisions of different ranks in the forestry industry, practical implementation of production processes, documentation management

Learning Outcomes
ON 11 To evaluate the worlds forest resources to evaluate balneological and mud- healing recreational resources own forest management documentation to manage the main production funds, and the economic efficiency of their use own the structure of the industry, evaluate competition in the commodity markets, antimonopoly legislation and concentration in the industry understand the role of the forest complex in the countrys economy, be guided by forest legislation.

Learning outcomes by discipline
1) participates in the design and control of forest maintenance work and manage them;
2) uses modern methods of processing and analysis of forest information;
3) applies the results of the assessment of the structure and condition of plantings when justifying the expediency and planning activities at the objects of professional activity in order to achieve optimal forestry and economic results.

Prerequisites
Production practice 2

Postrequisites
Final examination

Production practice 3

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

Short description of discipline
Increasing forest productivity. The technology of obtaining lumber. The economy of hunting farms. Measures for the protection, reproduction and rational use of hunting and commercial biological resources. National wealth of the countries of the world. Assessment of the radioecological state of forests. The Constitution on Nature Protection. Forest legislation of the Republic of Kazakhstan.

Purpose of studying of the discipline
The purpose of the internship 3 is to obtain the necessary practical skills in the application of the requirements of the Forest Code, laws on the protection of endangered animals, birds; requirements of forest management, logging production, the economy of the country.

Learning Outcomes
ON 11 To evaluate the worlds forest resources to evaluate balneological and mud- healing recreational resources own forest management documentation to manage the main production funds, and the economic efficiency of their use own the structure of the industry, evaluate competition in the commodity markets, antimonopoly legislation and concentration in the industry understand the role of the forest complex in the countrys economy, be guided by forest legislation.

Learning outcomes by discipline
1) has the skills of independent planning and solving production tasks with the involvement of modern technical means;
2) develops and uses databases and information technologies to solve technical and economic problems in the field of activity;
3) formulates and solves problems that arise in the course of practical activity and require professional knowledge.

Prerequisites
Production practice 2

Postrequisites
Final examination

Forest botany

Discipline cycle	Basic disciplines
Course	1
Credits count	5
Knowledge control form	Examination

Short description of discipline
The discipline studies the diversity of the plant world, the external and internal structure of woody and herbaceous plants, methods of reproduction of taxonomy, ecology, geobotany, plant phytogeography, age and seasonal changes, taxonomic categories of modern plant taxonomy, a rational approach to the use of the plant world, plant life forms, phenological observations of plant growth and development.

Purpose of studying of the discipline
Өсімдіктердің анатомиясы мен морфологиясын, көптүрлілігін, олардың шығу тегін, таралуын, тіршілік ортасымен байланысын және адам үшін маңызын, эвлюциясын жеткілікті деңгейде меңгеруі қажет.

Learning Outcomes
ON 3 To be guided in the systematics, anatomy, morphology, physiology, laws of the ontogenesis of animals and birds; rational use of

hunting and commercial birds, based on modern methods; to regulate the number of forest animals, to carry out biotechnical measures; to organize and carry out accounting works of predatory animals, rodents, waterfowl, records of hog and field game; to carry out accounting of feeds of plant and animal origin, mushroom, twig; to carry out bonitization and assessment of hunting assigned, forest, steppe, swamp, mountain lands, to make a report on the accounting of hunting grounds.

Learning outcomes by discipline

1) knows the methods of reproduction, the processes of plant life, their dependence on environmental conditions and their role in the formation of ground cover;
2) recognizes the main types of various plant organs and their parts;
3) defines rare and endangered species of the region and measures for their protection.

Prerequisites

School course

Postrequisites

Basic and profile disciplines of the EP

Systematics of higher plants

Discipline cycle	Basic disciplines
Course	1
Credits count	5
Knowledge control form	Examination

Short description of discipline

The discipline studies the systematic, morphology, physiology, geography of plants, the patterns of ontogenesis, ecology of representatives of the main species of higher plants, classification, archegonia plants, mosses, planiform, fern-like division, ferns sub-division, angiosperm class, or flowering plants, subclass magnoliids, rosids, asterids, monocotyledons, phylogeny of taxonomic groups, patterns of taxonomy of higher, features of ontogenesis of gymnosperms.

Purpose of studying of the discipline

The objectives of the discipline are to study the basics of the systematics of higher plants, to create a fundamental level of knowledge, skills and abilities of students about the main stages and trends of development, distribution of higher plants.

Learning Outcomes

ON 3 To be guided in the systematics, anatomy, morphology, physiology, laws of the ontogenesis of animals and birds; rational use of hunting and commercial birds, based on modern methods; to regulate the number of forest animals, to carry out biotechnical measures; to organize and carry out accounting works of predatory animals, rodents, waterfowl, records of hog and field game; to carry out accounting of feeds of plant and animal origin, mushroom, twig; to carry out bonitization and assessment of hunting assigned, forest, steppe, swamp, mountain lands, to make a report on the accounting of hunting grounds.

Learning outcomes by discipline

1) to know the most important regularities of the systematics of higher plants;
2) to know the features of the ontogenesis of gymnosperms and angiosperms;
3) to determine the systematics, morphology and physiology, geography of plants, patterns of ontogenesis and ecology of representatives of the main species of higher plants

Prerequisites

School course

Postrequisites

Basic and profile disciplines of the EP

Systematics of lower plants

Discipline cycle	Basic disciplines
Course	1
Credits count	5
Knowledge control form	Examination

Short description of discipline

The discipline studies taxonomic units, virus, bacteria, general characteristics (construction, nutrition, reproduction, meaning); the main ecological groups of fungi, classification principles, taxonomic (systematic) units, virus, bacteria, general characteristics (construction, nutrition, reproduction, meaning), various methods of collection, storage, the study of water, distribution, economic significance, real fungi, lichenized fungi, the importance of biodiversity for the sustainability of the biosphere.

Purpose of studying of the discipline

The objectives of the discipline are to study the basics of the systematics of lower plants, to create a fundamental level of knowledge, skills and abilities of students about the main stages and trends of development, distribution of lower plants.

Learning Outcomes

ON 3 To be guided in the systematics, anatomy, morphology, physiology, laws of the ontogenesis of animals and birds; rational use of hunting and commercial birds, based on modern methods; to regulate the number of forest animals, to carry out biotechnical measures; to organize and carry out accounting works of predatory animals, rodents, waterfowl, records of hog and field game; to carry out accounting of feeds of plant and animal origin, mushroom, twig; to carry out bonitization and assessment of hunting assigned, forest, steppe, swamp, mountain lands, to make a report on the accounting of hunting grounds.

Learning outcomes by discipline

1) knows taxonomic (systematic) units, viruses, bacteria, general characteristics (structure, nutrition, reproduction, meaning);
2) defines the main ecological groups of fungi, classification principles;
3) applies various methods of collecting, storing and studying algae.

Prerequisites

School course

Postrequisites
Basic and profile disciplines of the EP

Soil Bonitization

Discipline cycle	Basic disciplines
Course	1
Credits count	5
Knowledge control form	Examination

Short description of discipline
The discipline studies the calculation of bonus points; bonus scales for individual crops; soil combinations in land assessment; differential rent, prospective assessment of soil fertility; granulometric composition, density of the solid phase of soils, saturation of soils with bases; morphological properties of the soil profile; soil maps, cartograms; land monitoring technologies
Purpose of studying of the discipline
The objectives of mastering the discipline are to assess the soil as a natural-historical body with fertility, which forces us to abstract from specific organizational and economic conditions and evaluate soils based on the properties and characteristics that the soil has acquired in the process of both natural-historical and socio-economic development.
Learning Outcomes
ON 8 To determine the level of soil fertility, their compliance with the requirements of forest crops; to use methods, technologies for monitoring land and soil bonity; to possess methods of protection, management of land resources; to determine the types of soil erosion and deflation; to control and improve the land reclamation condition; to combat soil salinization during the operation of irrigation systems; to assess the radioecological state of forests; to apply background monitoring of the content of pollutants in natural environments; to measure wind speeds and directions, soil, air and plant temperature.
Learning outcomes by discipline
1) knows modern methods of soil bonitization for agricultural, industrial and residential purposes;
2) owns modern methods and technologies of land monitoring using quantitative characteristics of soils;
3) conducts a qualitative and economic assessment of soils.
Prerequisites
Forest botany
Postrequisites
Forest crops

Land resources

Discipline cycle	Basic disciplines
Course	1
Credits count	5
Knowledge control form	Examination

Short description of discipline
The discipline studies the factors of soil formation; principles of land management; causes of changes in structure; systematization, processing and accounting of information about land plots; conservation of the natural environment; patterns of geography of the world`s soils, their properties, genesis, nature of economic use, productive potential; world soil classifications; use of soil cover.
Purpose of studying of the discipline
- acquisition of theoretical knowledge in the field of global laws of geography and genesis of soils, the state of world land resources, as well as in obtaining practical skills in analyzing the content of world soil maps and world soil classifications
Learning Outcomes
ON 8 To determine the level of soil fertility, their compliance with the requirements of forest crops; to use methods, technologies for monitoring land and soil bonity; to possess methods of protection, management of land resources; to determine the types of soil erosion and deflation; to control and improve the land reclamation condition; to combat soil salinization during the operation of irrigation systems; to assess the radioecological state of forests; to apply background monitoring of the content of pollutants in natural environments; to measure wind speeds and directions, soil, air and plant temperature.
Learning outcomes by discipline
1) knows the specifics of the use and spatial differentiation of land resources of the world and Kazakhstan to develop practical recommendations for the preservation of the natural environment;
2) identifies the causes of changes in the structure of land resources under the influence of anthropogenic activity;
3) owns the regulatory framework that ensures the use of land resources and environmental protection activities on the territory of the Republic of Kazakhstan
Prerequisites
Forest botany
Postrequisites
Forest crops

Forest soil science

Discipline cycle	Basic disciplines
Course	1
Credits count	5
Knowledge control form	Examination

Short description of discipline
The discipline studies the properties, composition, classification of soils; soil formation; soil-geographical zoning; soil fertility; methods of soil research; the regime of heat, moisture, air and light in forest soils; the effect of logging, forest fires on soil properties; cattle grazing; soil fertilization in forestry; absorption capacity of soil acidity.

Purpose of studying of the discipline
-- study of soil formation processes depending on the type of vegetation and their differences under different types of forests; study of soil types depending on the type of forest, formation of professional knowledge about the forest-growing properties of soils, ecological functions, methods of study, principles of forest soil assessment.
Learning Outcomes
ON 8 To determine the level of soil fertility, their compliance with the requirements of forest crops; to use methods, technologies for monitoring land and soil bonity; to possess methods of protection, management of land resources; to determine the types of soil erosion and deflation; to control and improve the land reclamation condition; to combat soil salinization during the operation of irrigation systems; to assess the radioecological state of forests; to apply background monitoring of the content of pollutants in natural environments; to measure wind speeds and directions, soil, air and plant temperature.
Learning outcomes by discipline
- master the basic physical, mechanical and technological properties of wood that affect the consumer properties of goods;
- to master the organizational and legal bases of standardization and certification of products; - to master the commodity characteristics of forest materials;
- to determine the quantity and quality of timber, to carry out their acceptance and labeling using standards and other regulatory documents.
Prerequisites
Forest botany
Postrequisites
Forest crops

Geographic Information Systems

Discipline cycle	Basic disciplines
Course	1
Credits count	3
Knowledge control form	Examination

Short description of discipline
The discipline studies the phenomena, processes of natural components in geographical complexes of different ranks; types, structure and functions of geoinformation systems; software tools; ways to create a digital basis; bindings and vectorization of the raster layer; visualization and publication of materials; geological maps of various complexity; instrumental and aerospace surveys of the area
Purpose of studying of the discipline
The purpose of studying the discipline is the introduction of GIS technologies in forestry, which means the transfer of cartographic databases to forestry enterprises, which makes it possible to independently obtain and print working versions of forest maps for an object of interest.
Learning Outcomes
ON 2 Perform measurements with geodetic instruments and perform their mathematical processing; master the basic concepts of GIS, modern methods of creating and organizing spatial data; perform geometric modeling, designing curves and surfaces; to develop digital models, forecasting processes and phenomena in forestry using information technologies; possess the conditions of occurrence of forest fires, the rules of work of forest fire services; carry out the decryption of information using aerospace methods.
Learning outcomes by discipline
1) be able to generate reports on the results of accounting and evaluation of forests, work with databases, various peripheral devices;
2) generalize heterogeneous information required when creating and operating GIS;
3) generate reports on the results of accounting and forest assessment, work with databases, various peripheral devices.
Prerequisites
Bases of economics, law and ecological knowledge
Postrequisites
Digitalization in forestry

Engineering geodesy

Discipline cycle	Basic disciplines
Course	1
Credits count	3
Knowledge control form	Examination

Short description of discipline
The discipline studies topographic maps and plans; measuring instruments, geodetic measurements and terrain surveys; geometric modeling; computer graphics software; design and technological documentation; methods and tools for the development and design of technical documentation, theodolite surveys, evaluation of the accuracy of geodetic measurements, leveling, center work, geometric parameters of structures during construction, measurement of lengths and squares.
Purpose of studying of the discipline
The purpose of studying the discipline is to study the issues and tasks of creating topographic and geodetic materials for the design of engineering structures, including forestry enterprises, as well as the development of measurement methods for carrying projects out to the terrain, construction and operation of structures.
Learning Outcomes
ON 2 Perform measurements with geodetic instruments and perform their mathematical processing; master the basic concepts of GIS, modern methods of creating and organizing spatial data; perform geometric modeling, designing curves and surfaces; to develop digital models, forecasting processes and phenomena in forestry using information technologies; possess the conditions of occurrence of forest fires, the rules of work of forest fire services; carry out the decryption of information using aerospace methods.
Learning outcomes by discipline
1) be able to use the results of geodetic works competently and, in particular, freely read a topographic map and solve on its basis the corresponding tasks of both graphical and mathematical-computational nature;

2) independently performs geodetic measurements and works;
3) owns systems and methods of planning the development of land resources, technological systems, means and methods of inventory and land management work, monitoring their condition, including methods, methods and means of collecting, processing and analyzing quantitative and qualitative characteristics.

Prerequisites
Bases of economics, law and ecological knowledge

Postrequisites
Digitalization in forestry

Engineering and computer graphics

Discipline cycle	Basic disciplines
Course	1
Credits count	3
Knowledge control form	Examination

Short description of discipline
The discipline studies digital graphics, algorithms of computational geometry and geometric modeling, construction of curves and surfaces; raster graphics; drawing graphic lines, circles, ellipses; execution and reading of drawings; classification of axonometric projections; types of buildings and stages of their design; working drawings; drawings of structures; design of a real object.

Purpose of studying of the discipline
The purpose of studying the discipline is - the execution and reading of drawings for various purposes and the solution of engineering and geometric problems used in forestry

Learning Outcomes
ON 2 Perform measurements with geodetic instruments and perform their mathematical processing; master the basic concepts of GIS, modern methods of creating and organizing spatial data; perform geometric modeling, designing curves and surfaces; to develop digital models, forecasting processes and phenomena in forestry using information technologies; possess the conditions of occurrence of forest fires, the rules of work of forest fire services; carry out the decryption of information using aerospace methods.

Learning outcomes by discipline
1) knows the elements of descriptive geometry and engineering graphics, geometric modeling, computer graphics software.
2) is able to present technical solutions using computer graphics and geometric modeling tools;
3) owns modern software tools for the preparation of design and technological documentation, methods and tools for the development and execution of technical documentation.

Prerequisites
Bases of economics, law and ecological knowledge

Postrequisites
Digitalization in forestry

State forest pathology monitoring

Discipline cycle	Basic disciplines
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline
The discipline studies methods of reconnaissance, detailed forest pathology examination; forest quarantine, examination of soil occupancy by root pests; methods of supervision and examination in pest foci; in foci of coniferous leaf-gnawing insects; pheromone supervision; dynamics of forest condition changes; analysis of remote observation data; determination of the average score of crop damage; forecast, timely detection of deviations.

Purpose of studying of the discipline
The purpose of studying the discipline is to study the features of forest pathology monitoring

Learning Outcomes
ON 6 Apply technologies and methods of growing various types of planting material in nurseries; to grow forest-cultural planting material; determine the harmfulness of pests of agricultural crops; analyze information about the forest pathological state of forests, and the operational impact on the causal factor; to determine the species of forest pests; apply biological, chemical, physical, forestry methods of protection against pests and diseases; to conduct phytopathological examinations; to diagnose and spread diseases of migrating animals and birds and their significance in forestry and medicine.

Learning outcomes by discipline
1) the ability to plan and control the work on the protection and
protection of forests from harmful organisms;
2) evaluate the performance of work to control the sanitary and
forest-pathological condition of forests when performing ground and aviation work;
3) to determine the prospects for development in the field of professional activity using a variety of methods and technologies, including innovative ones, in terms of combating harmful coniferous and leaf-eating insects in conditions of their mass reproduction

Prerequisites
Animal biology

Postrequisites
Forest protection

Forest Entomology

Discipline cycle	Basic disciplines

Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline
The discipline studies representatives of ecological and economic groups of harmful and beneficial entomofauna, phases of development and damage to wood-shrub, ornamental vegetation, pests of fruits and seeds, nurseries, root pests, coniferous and leaf-gnawing, stem, technical pests, measures to combat them, methods and technical means of protecting forests, pests of harvested wood.

Purpose of studying of the discipline
The purpose of mastering the discipline is to study the basics of morphology, anatomy, ecology, biology of pests of the main forest-forming species; mastering the skills of diagnostics and conducting methods of combating the main pests of forest crops in the region.

Learning Outcomes
ON 6 Apply technologies and methods of growing various types of planting material in nurseries; to grow forest-cultural planting material; determine the harmfulness of pests of agricultural crops; analyze information about the forest pathological state of forests, and the operational impact on the causal factor; to determine the species of forest pests; apply biological, chemical, physical, forestry methods of protection against pests and diseases; to conduct phytopathological examinations; to diagnose and spread diseases of migrating animals and birds and their significance in forestry and medicine.

Learning outcomes by discipline
1) identify insects – representatives of the main ecological and economic groups of harmful and beneficial entomofauna;
2) to observe the life of insects, to have the skills to work with exhibits and natural objects;
3) to recognize the main plant pests by individual phases of their development and by the damage caused to tree-shrub, ornamental and other vegetation, as well as individual plant objects and plant products, including various traces of vital activity.

Prerequisites
Animal biology

Postrequisites
Forest protection

General Entomology

Discipline cycle	Basic disciplines
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline
The discipline studies the general structure of insects, morphology, biology, ecology, systematics, external and internal structure, stages of development, types of nutrition, determinants, segmental composition of the head, specialization of the thoracic department, limb structure, leg types, wing structures in various insect orders, abdominal department, the basics of modern insect classification.

Purpose of studying of the discipline
The purpose of studying the discipline is to prepare students – in the field of determining the species of pests and their characteristics.

Learning Outcomes
ON 6 Apply technologies and methods of growing various types of planting material in nurseries; to grow forest-cultural planting material; determine the harmfulness of pests of agricultural crops; analyze information about the forest pathological state of forests, and the operational impact on the causal factor; to determine the species of forest pests; apply biological, chemical, physical, forestry methods of protection against pests and diseases; to conduct phytopathological examinations; to diagnose and spread diseases of migrating animals and birds and their significance in forestry and medicine.

Learning outcomes by discipline
1) to recognize the main pests of plants by individual phases of their development and by the damage they cause;
2) possess methods of monitoring the condition of plantings, a system of supervision and prediction of foci of insect pests;
3) identify and diagnose the causes of reduced stability, desiccation, loss of useful properties and functions of forest and urban ecosystems that contribute to the spread of pests

Prerequisites
Animal biology

Postrequisites
Forest protection

Mechanization of forest operations

Discipline cycle	Basic disciplines
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline
The discipline studies the operation of machinery, finding and troubleshooting; machines for reforestation and afforestation, planting, care, logging, protection; equipment for protecting forests from pests, diseases, fires; machines and equipment for harvesting cones, seed treatment; the device of garden, plantation, shrub-marsh plows; design parameters of pointed paws; portable motor tools, electrical equipment of cars and tractors.

Purpose of studying of the discipline
The purpose of the discipline "Mechanization of forestry works" is to master students` theoretical knowledge of the main sections of the discipline and their practical application in solving applied problems of complex mechanization of forestry production, to create prerequisites for the successful development of special disciplines and to ensure comprehensive technical training of future specialists.

Learning Outcomes
ON 5 Use machines, machine-tractor fleet and technological processes in forestry and agriculture; use ways to increase the efficiency of aggregates, the development of power plants; use the theory of cutting logs for sawn products; use the forms of whips, logs and methods for determining their volumes; apply heat treatment processes and their technologies; apply classifications and standardization of forest products in accordance with GOST standards; to determine resource-saving technologies in logging production.

Learning outcomes by discipline
1) apply progressive resource-saving and energy-efficient forestry technologies;
2) to organize rational maintenance of production;
3) perform all types of forestry work in the areas of reforestation and afforestation, forest care, logging, protection and protection of forests from pests, diseases and fires

Prerequisites
Engineering geodesy

Postrequisites
Forest management

The system of machines in forestry

Discipline cycle	Basic disciplines
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline
The discipline studies the methods of operation of technical means and methods of rational use of machine systems in forestry, the organization of work on the operation of machines, mechanisms and specialized equipment; technological systems, labor organization and technical and economic calculations of the effectiveness of machine systems in forestry; technological processes with a completed production cycle.

Purpose of studying of the discipline
to prepare students for practical activities on the implementation of mechanized technological processes with a complete production cycle using zonal systems of machines in forestry and rational acquisition of the machine-tractor fleet of the enterprise, to master the organization of labor and technical and economic calculations of the effectiveness of machine systems.

Learning Outcomes
ON 5 Use machines, machine-tractor fleet and technological processes in forestry and agriculture; use ways to increase the efficiency of aggregates, the development of power plants; use the theory of cutting logs for sawn products; use the forms of whips, logs and methods for determining their volumes; apply heat treatment processes and their technologies; apply classifications and standardization of forest products in accordance with GOST standards; to determine resource-saving technologies in logging production.

Learning outcomes by discipline
1) to improve the means of mechanization;
2) to ensure the organization of work on the operation of machines, mechanisms and specialized equipment in carrying out forestry, fire-fighting, forest protection, forestry and cultural works;
3) apply technological systems, means and methods of forest care, protection, protection, reproduction of forests in solving professional tasks.

Prerequisites
Engineering geodesy

Postrequisites
Forest management

Operation of the machine park

Discipline cycle	Basic disciplines
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline
The discipline studies the rational use of the machine and tractor fleet in agriculture and forestry; assembly of aggregates; ways to increase the efficiency of aggregates, the maximum annual output of power plants; technical service in the machine and tractor fleet; calculation of projected machines; maintenance and diagnostics of machines.

Purpose of studying of the discipline
The purpose of the discipline "Operation of the machine and tractor fleet" is to acquire knowledge, skills and abilities for the rational and highly efficient use of machine and tractor units to maximize crop production at the lowest cost and taking into account environmental requirements.

Learning Outcomes
ON 5 Use machines, machine-tractor fleet and technological processes in forestry and agriculture; use ways to increase the efficiency of aggregates, the development of power plants; use the theory of cutting logs for sawn products; use the forms of whips, logs and methods for determining their volumes; apply heat treatment processes and their technologies; apply classifications and standardization of forest products in accordance with GOST standards; to determine resource-saving technologies in logging production.

Learning outcomes by discipline
1) design the composition of the machine and tractor fleet (MTP) of an agricultural enterprise;
2) use the calculation methodology of the designed machines;
3) provide organizational, technical and technological issues for the maintenance and diagnosis of machines

Prerequisites
Engineering geodesy
Postrequisites
Forest management

Aerospace methods in forestry

Discipline cycle	Basic disciplines
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline
The discipline studies methods of taxation, measurement decoding; creation of forest maps; field, aerial, desk decoding; technogenic impact on forest ecosystems; pyrologic monitoring; creation of forest maps, aerial, space photography; aircraft of their types, types; principles of landscape planning; natural, anthropogenic formations; decoding of the composition of the stand; spectral reflectivity of wood rocks; forest phototones.
Purpose of studying of the discipline
The purpose of the discipline is the acquisition by students of knowledge and skills of studying and controlling the economic use of forest resources based on aerospace methods.
Learning Outcomes
ON 2 Perform measurements with geodetic instruments and perform their mathematical processing; master the basic concepts of GIS, modern methods of creating and organizing spatial data; perform geometric modeling, designing curves and surfaces; to develop digital models, forecasting processes and phenomena in forestry using information technologies; possess the conditions of occurrence of forest fires, the rules of work of forest fire services; carry out the decryption of information using aerospace methods.
Learning outcomes by discipline
1) knows aerospace methods, their essence and variety;
2) is able to carry out field, aerovisual, desk decryption;
3) owns methods of taxational decryption, methods of creating forest maps.
Prerequisites
Engineering geodesy
Postrequisites
Forest taxation

Forest pyrology

Discipline cycle	Basic disciplines
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline
The discipline studies the conditions of occurrence, spread, behavior of forest fires; classification of forest fires, signs; specialized forest fire departments of forestry enterprises; methods, methods of extinguishing forest fires; post-pyrogenic restoration of forests; conditions for stopping burning, forecasting the development of forest fires, the organization of preventive fire-fighting measures; measures to protect against possible consequences.
Purpose of studying of the discipline
The purpose of studying the discipline is to acquire skills in protecting forests from fires, their prevention, timely detection and prompt elimination, as the main direction for ensuring the environmental safety of the state.
Learning Outcomes
ON 2 Perform measurements with geodetic instruments and perform their mathematical processing; master the basic concepts of GIS, modern methods of creating and organizing spatial data; perform geometric modeling, designing curves and surfaces; to develop digital models, forecasting processes and phenomena in forestry using information technologies; possess the conditions of occurrence of forest fires, the rules of work of forest fire services; carry out the decryption of information using aerospace methods.
Learning outcomes by discipline
1) knows specialized forest fire departments of forestry enterprises;
2) distinguishes according to the classification of forest fires and their main signs;
3) owns methods, methods of extinguishing forest fires: conditions for stopping gorenje, chemicals used to fight forest fires.
Prerequisites
Engineering geodesy
Postrequisites
Forest taxation

Digitalization in forestry

Discipline cycle	Basic disciplines
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline
The discipline studies an automated forest resource management system, the development of digital infrastructure; an automated workplace; methods of obtaining and processing digital spatial information; independent control of forest management processes; laser scanning of wood; remote sensing; unmanned aerial vehicles; digital environment; infocommunication and web technologies; multispectral satellite images for assessing forest plantations.

Purpose of studying of the discipline
- formation of organizational skills, skills, evaluation of forestry measures for the introduction of new equipment and technology
Learning Outcomes
ON 2 Perform measurements with geodetic instruments and perform their mathematical processing; master the basic concepts of GIS, modern methods of creating and organizing spatial data; perform geometric modeling, designing curves and surfaces; to develop digital models, forecasting processes and phenomena in forestry using information technologies; possess the conditions of occurrence of forest fires, the rules of work of forest fire services; carry out the decryption of information using aerospace methods.
Learning outcomes by discipline
1.is able to use digital resources, scientific, experimental and instrument base for conducting research in professional activities;
2. able to analyze and select the optimal electronic document management system that meets the objectives of the forestry organization;
3. is able to use GIS to create a digital cartographic database
Prerequisites
Engineering geodesy
Postrequisites
Forest taxation

Diseases of animals and birds

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

Short description of discipline
The discipline studies infectious, invasive diseases; planning preventive measures for diseases of animals and birds; using methods of clinical research of animals and birds; making an accurate diagnosis; prescribing effective, timely treatment; analysis of feeding conditions, maintenance, occurrence, manifestation of the disease; physiological data of diseases of birds of prey, bees, fur-bearing animals, exotic animals, commercial fish.
Purpose of studying of the discipline
The main purpose of the discipline is to study pathogenic microbes-pathogens of infectious diseases of animals and birds (zoonoses), as well as the concepts of non-infectious and contagious diseases, the role of microorganisms, viruses and parasites in the infectious pathology of animals, the relationship of microbiology with epizootology and epidemiology
Learning Outcomes
ON 6 Apply technologies and methods of growing various types of planting material in nurseries; to grow forest-cultural planting material; determine the harmfulness of pests of agricultural crops; analyze information about the forest pathological state of forests, and the operational impact on the causal factor; to determine the species of forest pests; apply biological, chemical, physical, forestry methods of protection against pests and diseases; to conduct phytopathological examinations; to diagnose and spread diseases of migrating animals and birds and their significance in forestry and medicine.
Learning outcomes by discipline
1) diagnose and recognize non-contagious and contagious diseases of animals and birds;
2) evaluate diseases of migrating animals and birds;
3) plan preventive measures for diseases of animals and birds
Prerequisites
General Entomology
Postrequisites
Protection of animals and birds

Forest phytopathology

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

Short description of discipline
The discipline studies the nature of pathological changes in various types of diseases; pathogenic organisms; methods of diagnosis of major diseases of infectious and non-infectious nature; viral diseases caused by ultramicroscopic living protein substances; etiology of mucus, gum, tarring; sporulation of basidiomycetes; imperfect fungi; types of phytopathogenic bacteria; symptoms of chlorosis, etiolization; treatment of dying shoots, bark burn.
Purpose of studying of the discipline
The purpose of studying forest phytopathology is the professional training of forestry engineers in the field of protecting forest plantations from diseases and harvested timber from bio-damage.
Learning Outcomes
ON 6 Apply technologies and methods of growing various types of planting material in nurseries; to grow forest-cultural planting material; determine the harmfulness of pests of agricultural crops; analyze information about the forest pathological state of forests, and the operational impact on the causal factor; to determine the species of forest pests; apply biological, chemical, physical, forestry methods of protection against pests and diseases; to conduct phytopathological examinations; to diagnose and spread diseases of migrating animals and birds and their significance in forestry and medicine.
Learning outcomes by discipline
1) to know the nature of pathological changes in various types of diseases;
2) recognize diseases caused by adverse environmental factors and pathogenic organisms;
3) possess methods of diagnosis of the main diseases of infectious and non-infectious nature
Prerequisites

General Entomology

Postrequisites

Protection of animals and birds

Forest protection

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

Short description of discipline

The discipline studies forestry methods of forest protection; accounting, evaluation of indicators of the radio ecological state of forests; development of measures for the protection of forest vegetation; biological, chemical, physical protection of forests; environmental legislation, preparation of a radioecological report in the prescribed form; types of impact of economic activity on the environment; health and sanitary measures.

Purpose of studying of the discipline

The purpose of the discipline is the formation of students` knowledge and skills in the protection of wood and ornamental species from diseases and pests, skills in the use of biological and chemical protection of wood and ornamental species in forestry, contributing to increased productivity of plantings and environmental protection

Learning Outcomes

ON 6 Apply technologies and methods of growing various types of planting material in nurseries; to grow forest-cultural planting material; determine the harmfulness of pests of agricultural crops; analyze information about the forest pathological state of forests, and the operational impact on the causal factor; to determine the species of forest pests; apply biological, chemical, physical, forestry methods of protection against pests and diseases; to conduct phytopathological examinations; to diagnose and spread diseases of migrating animals and birds and their significance in forestry and medicine.

Learning outcomes by discipline

1) participates in the organization of protection of forestry facilities from pests and diseases on the basis of existing forest protection requirements, norms and rules;
2) applies methods of accounting for the number of pests and assessing the infestation of forestry facilities with diseases;
3) applies modern information technology and tools for the purposes of forest protection

Prerequisites

General Entomology

Postrequisites

Protection of animals and birds

Aerial forest reclamation

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

Short description of discipline

The discipline studies physical processes, phenomena in a free atmosphere; irrigation system, its elements, irrigation methods; soil and irrigation zoning of the territory; hydraulic engineering works; the use of fertilizers on eroded soils; grain- steam, grain- tillage crop rotations; afforestation and consolidation of sands; snow-regulating influence of forest strips; the factor of the relationship of trees and shrubs

Purpose of studying of the discipline

- to equip students with knowledge about the role of protective plantings in reducing soil erosion, stabilizing highly productive production of environmentally safe agricultural products, improving the habitat of human society, to create, form and reconstruct protective forest plantings to perform diverse functions in specific conditions with the expectation of ensuring their maximum effect.

Learning Outcomes

ON 8 To determine the level of soil fertility, their compliance with the requirements of forest crops; to use methods, technologies for monitoring land and soil bonity; to possess methods of protection, management of land resources; to determine the types of soil erosion and deflation; to control and improve the land reclamation condition; to combat soil salinization during the operation of irrigation systems; to assess the radioecological state of forests; to apply background monitoring of the content of pollutants in natural environments; to measure wind speeds and directions, soil, air and plant temperature.

Learning outcomes by discipline

1) knows the types and methods of designing agroforestry measures;
2) develops and justifies the necessary volumes and placement of agroforestry territorial complexes;
3) has the skills of selecting breeds and varieties in protective forest strips of various functional purposes.

Prerequisites

Dendrology

Postrequisites

Landscaping of populated areas

Forest reclamation

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

Short description of discipline

The discipline studies the construction of forest strips; protective afforestation; forest strips on non-irrigated lands; afforestation of mountain slopes, economic use of sand; pasture-protective forest strips; erosion, deflation of soils; the positive multifunctional role of forest-reclamation plantations; studies the interconnected system of forest strips; violations, restoration, transformation, conservation of natural landscapes; biological measures to combat land degradation.

Purpose of studying of the discipline

To give students the theoretical foundations of knowledge about the methods and techniques of complex interaction in order to increase the productivity of reclamation lands and rational nature management.

Learning Outcomes

ON 8 To determine the level of soil fertility, their compliance with the requirements of forest crops; to use methods, technologies for monitoring land and soil bonity; to possess methods of protection, management of land resources; to determine the types of soil erosion and deflation; to control and improve the land reclamation condition; to combat soil salinization during the operation of irrigation systems; to assess the radioecological state of forests; to apply background monitoring of the content of pollutants in natural environments; to measure wind speeds and directions, soil, air and plant temperature.

Learning outcomes by discipline

1) knows about the global processes of human influence on the environment and the possibilities of minimizing negative processes by methods of forest reclamation;
2) develops a design solution, uses methods of selecting the structure and parameters to create systems of protective forest plantations;
3) designs systems of protective forest plantations.

Prerequisites

General Entomology

Postrequisites

Protection of animals and birds

Chemical reclamation

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

Short description of discipline

The discipline studies methods of optimizing mineral nutrition of plants; agrochemical properties of soil; doses of fertilizers, methods of their application in crop rotations; balance of nutrients phytocenoses; determination of the removal of nutrients by plants; liming, gypsum, acidification; cycle management, balance regulation of growth factors; inactivation of mobile forms of heavy metals, reducing their intake into plants.

Purpose of studying of the discipline

- to provide theoretical and practical training of students in the field of knowledge about the chemical composition, properties of soils and features of chemical processes in the functioning of soils as a special natural-historical body, as well as its constituent mineral, organic and organomineral components.

Learning Outcomes

ON 8 To determine the level of soil fertility, their compliance with the requirements of forest crops; to use methods, technologies for monitoring land and soil bonity; to possess methods of protection, management of land resources; to determine the types of soil erosion and deflation; to control and improve the land reclamation condition; to combat soil salinization during the operation of irrigation systems; to assess the radioecological state of forests; to apply background monitoring of the content of pollutants in natural environments; to measure wind speeds and directions, soil, air and plant temperature.

Learning outcomes by discipline

1) knows the basic principles and techniques of optimizing the mineral nutrition of plants and agrochemical properties of the soil with the help of fertilizers and chemical reclamation to increase the production of plant products of good quality;
2) determines and corrects the doses of fertilizers, the timing and methods of their application in crop rotations based on the determination of the removal of nutrients by plants and the balance of nutrients in phytocenoses;
3) analyzes and evaluates the state of soil fertility to make decisions on optimizing plant nutrition conditions.

Prerequisites

Dendrology

Postrequisites

Landscaping of populated areas

Forest taxation

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

Short description of discipline

The discipline studies the methods of taxation of forest plantations and forest products, forest sorting; methods for determining the growth of individual trees; taxation of felled trees, the current increase in the volume of trunks; tree stands of the tier; forest inventory; taxation of tree growth, woodlands and cutting stock; material and monetary assessment of cutting areas; desk processing; accounting for stocks of plantings.

Purpose of studying of the discipline

– teaching students the theoretical foundations of forest taxation, the basic methods of taxation of forest objects, obtaining practical skills in performing forest taxation works in relation to various objects of forest taxation, training in the proper organization and management of integrated forestry related to forest and logging funds.

Learning Outcomes

ON 9 To make taxational descriptions of plantings; to analyze and use information about the state of forests; to plan environmental

protection measures on the territory of nature reserves, parks, reserves; to apply technological processes of logging operations; apply modern concepts of nature protection and rational use of natural resources; get different types of side use; organize economically sustainable forest management.

Learning outcomes by discipline

1) finds optimal solutions to problems and specific tasks in the field of accounting and evaluation of forest resources and urban plantations, applies the received forest taxational knowledge in practice;
2) knows the taxation indicators of trees, stands, plantings and methods of their determination, the basic laws and patterns of growth and structure of stands, the content of GOST, OST, other standards regulating forest assessment work;
3) owns methods of taxation of individual trees, stands, plantings, urban plantings, forest and logging funds and harvested forest products, methods of research on the structure, growth and commodity structure of stands, forest taxing devices and tools.

Prerequisites

Forest Biometrics

Postrequisites

Forest Management

Specially protected natural areas

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

Short description of discipline

The discipline studies intangible cultural heritage, natural heritage; world value, integrity criteria, preservation; state regime for the protection of cultural heritage monuments; law on specially protected natural territories; planning, organization of environmental protection measures; buffer zones; analysis of the effectiveness of nature reserves, biosphere reserves, nature reserves, natural parks, natural monuments, national parks, arboretums parks, botanical gardens.

Purpose of studying of the discipline

formation of students` knowledge about specially protected natural territories in accordance with the competencies being formed.

Learning Outcomes

ON 9 To make taxational descriptions of plantings; to analyze and use information about the state of forests; to plan environmental protection measures on the territory of nature reserves, parks, reserves; to apply technological processes of logging operations; apply modern concepts of nature protection and rational use of natural resources; get different types of side use; organize economically sustainable forest management.

Learning outcomes by discipline

1) manage specially protected natural territories;
2) apply knowledge on systematics and biodiversity of plants and animals to solve problems of nature protection, protection of protected areas;
3) analyze the effectiveness of the activities of specially protected areas;

Prerequisites

Forest Biometrics

Postrequisites

Forest Management

Assessment and accounting of forest plant resources

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

Short description of discipline

The discipline studies morphology, species diversity, geographical distribution, woody, pulp- and- pulp plants, subshell of deciduous, coniferous species: raw material base, ecology of subshell, exploitation of resin deposits; accounting, use of root systems; forest medicinal plants, forest food plants, characteristics, classification, value, stock assessment; comprehensive assessment; productive, protective, socio-economic functions of forest resources; expediency of using raw materials.

Purpose of studying of the discipline

– formation of in-depth professional knowledge in the field of forestry, forestry, forest management, forest taxation.

Learning Outcomes

ON 8 To determine the level of soil fertility, their compliance with the requirements of forest crops; to use methods, technologies for monitoring land and soil bonity; to possess methods of protection, management of land resources; to determine the types of soil erosion and deflation; to control and improve the land reclamation condition; to combat soil salinization during the operation of irrigation systems; to assess the radioecological state of forests; to apply background monitoring of the content of pollutants in natural environments; to measure wind speeds and directions, soil, air and plant temperature.

Learning outcomes by discipline

1) knows the indicators and criteria for assessing the effective use of forest resources;
2) assesses the resource potential of the forest, determines the expediency of using raw materials, determines the economic efficiency of consumption;
3) has the skills of competent argumentation in analyzing and evaluating the level of organization of the use and reproduction of forest resources and forest utilities, and making decisions to improve forest management.

Prerequisites

Forest Biometrics

Postrequisites

Forest Management

Forest management

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

Short description of discipline

The discipline studies the methods of calculating the permissible volumes of use; the impact of the intensity of forest use on the quality of forest resources, ecosystem services of the forest; the state; organization, provision of technological processes of logging, wood processing industries; modern machines, mechanisms for logging; requirements of the forest legislation of the Republic of Kazakhstan.

Purpose of studying of the discipline

The purpose of teaching the discipline "Forest Management" is the formation of professional competence of future forestry technicians in the field of technological and organizational work related to the implementation of forest uses on the lands of the state forest fund.

Learning Outcomes

ON 9 To make taxational descriptions of plantings; to analyze and use information about the state of forests; to plan environmental protection measures on the territory of nature reserves, parks, reserves; to apply technological processes of logging operations; apply modern concepts of nature protection and rational use of natural resources; get different types of side use; organize economically sustainable forest management.

Learning outcomes by discipline

1) assesses the impact of the intensity of forest management on the quality of forest resources and ecosystem services of the forest, including using mathematical modeling tools;
2) owns the methods of calculating the permissible volumes of use for different types of forest use;
3) owns the peculiarities of the organization of forest management, depending on the purpose of forests.

Prerequisites

Forest taxation

Postrequisites

World forest resources

Secondary use

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

Short description of discipline

The discipline studies the types of secondary use; products of lifetime use, documentation, the right to implement secondary forest management; technology of obtaining, pickling, drying; evaluation of the quality of medicinal herbs; processing, use of forest chemical raw materials; industrial harvesting of berries, mushrooms, medicinal plants, tree juices; control over compliance with the rules of secondary forest use.

Purpose of studying of the discipline

The purpose of studying the discipline is to study the methods of accounting, rational use and reproduction of non–wood products.

Learning Outcomes

ON 10 Apply the classification of hunting farms: commercial and sports; possess the main legislative acts in the field of hunting and the Forest Code in the Republic of Kazakhstan; own the main legislative acts of the Republic of Kazakhstan in the field of hunting; use the results of accounting work, data on production during seasonal hunting events; possess the features of biology, distribution of commercial animals and birds; apply the features of zoogeographic distribution of representatives of hunting commercial animals and birds; use an algorithm of actions when detecting violations of andatory requirements in the field of hunting and conservation of hunting resources.

Learning outcomes by discipline

1) draws up documentation giving the right to carry out secondary forest management;
2) organizes industrial harvesting of berries, mushrooms, medicinal plants, tree juices;
3) monitors compliance with the rules of secondary forest management.

Prerequisites

Forest taxation

Postrequisites

World forest resources

Rational use of natural resources

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

Short description of discipline

The discipline studies the types, forms, methods, specifics of rational nature management; forestry; global, regional, local nature management; mineral and raw materials, forest management; regulation of natural, natural, anthropogenic processes; negative changes in the natural environment; internal dynamic equilibrium; local transformation of nature; holistic geosystem, taking into account the real socio-ecological, economic situations.

Purpose of studying of the discipline

The purpose of mastering the discipline "Landscaping of populated areas" is to master the skills of students in creating and caring for landscaping objects in populated areas.

Learning Outcomes

ON 9 To make taxational descriptions of plantings; to analyze and use information about the state of forests; to plan environmental protection measures on the territory of nature reserves, parks, reserves; to apply technological processes of logging operations; apply modern concepts of nature protection and rational use of natural resources; get different types of side use; organize economically sustainable forest management.

Learning outcomes by discipline

1) knows the main types of forest management, domestic and foreign experience of rational forest management;
2) organizes and conducts activities aimed at preventing losses of forest products, increasing the productivity of forest plantations;
3) knows the methods and methods for the rational management of forestry, assessment and making optimal decisions aimed at preventing losses.

Prerequisites

Forest taxation

Postrequisites

World forest resources

Landscape design

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

Short description of discipline

The discipline studies methods of designing landscape architecture objects, creating compositions from plants; small architectural forms, planning, stylistics, zoning, sketching; methods of landscape research; landscaping of public places; development of a landscape project of a site; methods of individual landscape projects for territories of various types; methods of geoplasty and visualization of landscape landscape.

Purpose of studying of the discipline

The purpose of teaching the discipline Landscape Design is to study the theoretical and practical foundations of landscape design.

Learning Outcomes

ON 7 Manage specially protected natural territories; carry out measures for the protection of animals and birds, in the fight against poaching, stray dogs, harmful animals and birds; analyze the effectiveness of the activities of national natural parks and reserves of Kazakhstan; develop and design projects of landscaping objects; apply a set of measures for the cultivation of flower, greenhouse trees, shrubs and ornamental plants; use natural territorial complexes of forests, methods of landscape research.

Learning outcomes by discipline

1) knows the principles of creating compositions from plants using small architectural forms, the basics of planning, stylistics, zoning and other aspects of designing landscape architecture objects;
2) independently develops sketches of objects and various elements of landscape design;
3) has general methodological techniques for designing landscape architecture objects.

Prerequisites

Dendrology

Postrequisites

World forest resources

Landscaping of populated areas

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

Short description of discipline

The discipline studies methods, methods, types of creation and operation of plantings; aesthetic, sanitary and hygienic and functional qualities of systems; engineering and agrotechnical preparation of green construction territories; the role of green spaces in the formation of the external environment; design of territories for landscaping settlements; operation of green spaces in settlements.

Purpose of studying of the discipline

- formation of special knowledge of the theory of landscape architecture, landscape design and landscape design, practical skills of landscape organization of urban and recreational areas, landscaping of landscape architecture objects, as well as the development of creative abilities of students in general.

Learning Outcomes

ON 7 Manage specially protected natural territories; carry out measures for the protection of animals and birds, in the fight against poaching, stray dogs, harmful animals and birds; analyze the effectiveness of the activities of national natural parks and reserves of Kazakhstan; develop and design projects of landscaping objects; apply a set of measures for the cultivation of flower, greenhouse trees, shrubs and ornamental plants; use natural territorial complexes of forests, methods of landscape research.

Learning outcomes by discipline

1) performs design drawings of landscaping objects using computer programs;
2) organizes gardening and landscape works;
3) designs territories for landscaping populated areas with the basics of urban planning.

Prerequisites

Dendrology

Postrequisites

World forest resources

Floriculture and greenhouse business

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

Short description of discipline
The discipline studies the structure of flower and ornamental plants; the influence of environmental factors; mechanization technological processes; compilation, design of flower expositions; technique, technology of modern floriculture, landscaping; biologically stable flower compositions; methods of reproduction, cultivation of flowers in protected, open ground; seed production of flower plants; care of flower; greenhouse floriculture; the place of flowers in gardening.

Purpose of studying of the discipline
The purpose of the discipline is to teach students the knowledge and skills necessary for the cultivation of ornamental flowering plants based on modern achievements of science and practice in the field of green construction, namely, floriculture.

Learning Outcomes
ON 7 Manage specially protected natural territories; carry out measures for the protection of animals and birds, in the fight against poaching, stray dogs, harmful animals and birds; analyze the effectiveness of the activities of national natural parks and reserves of Kazakhstan; develop and design projects of landscaping objects; apply a set of measures for the cultivation of flower, greenhouse trees, shrubs and ornamental plants; use natural territorial complexes of forests, methods of landscape research.

Learning outcomes by discipline
1) knows the varietal diversity of floral and ornamental plants;
2) creates biologically sustainable flower arrangements;
3) owns the methods of reproduction and the peculiarities of growing ornamental flower crops in protected and open ground.

Prerequisites
Dendrology

Postrequisites
World forest resources

Reserved business

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

Short description of discipline
The discipline studies the categories, systems, structure of the reserve fund in the world; management and analysis of the activities of reserves; ecologization of nature management; development and design of projects of reserve objects; model of the biosphere reserve; the importance of conservation for the water management complex; problems of conservation in the world, region.

Purpose of studying of the discipline
To provide knowledge about the existing specially protected nature protection zones in the Republic of Kazakhstan and methods of their management.

Learning Outcomes
ON 7 Manage specially protected natural territories; carry out measures for the protection of animals and birds, in the fight against poaching, stray dogs, harmful animals and birds; analyze the effectiveness of the activities of national natural parks and reserves of Kazakhstan; develop and design projects of landscaping objects; apply a set of measures for the cultivation of flower, greenhouse trees, shrubs and ornamental plants; use natural territorial complexes of forests, methods of landscape research.

Learning outcomes by discipline
1) manage specially protected natural territories; carry out measures for the protection of animals and birds, in the fight against poaching, stray dogs, harmful animals and birds;
2) analyze the effectiveness of the national nature parks and reserves of Kazakhstan;
3) develop and design projects of landscaping facilities, use natural territorial complexes of forests, methods of landscape research;

Prerequisites
Biotechnological and breeding of game birds

Postrequisites
Forest legislation

National natural parks and reserves of Kazakhstan

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

Short description of discipline
The discipline studies a set of measures for the development and conservation of biodiversity; planning measures to control the number of harmful fauna; conservation of rare animals, birds and plants; aesthetic advantages of the surrounding landscape; scientific, pragmatic, aesthetic forecast of approaches to the organization of national parks; objects of historical and cultural heritage; ecological tourism.

Purpose of studying of the discipline
The purpose of teaching the discipline is to know the regional patterns of formation, functioning, spatial differentiation, economic use and ecological state of the natural environment of the Republic of Kazakhstan.

Learning Outcomes
ON 7 Manage specially protected natural territories; carry out measures for the protection of animals and birds, in the fight against

poaching, stray dogs, harmful animals and birds; analyze the effectiveness of the activities of national natural parks and reserves of Kazakhstan; develop and design projects of landscaping objects; apply a set of measures for the cultivation of flower, greenhouse trees, shrubs and ornamental plants; use natural territorial complexes of forests, methods of landscape research.

Learning outcomes by discipline

1) analyze the effectiveness of the national nature parks and reserves of Kazakhstan;
2) apply a set of measures for the development and conservation of biodiversity of national natural parks of Kazakhstan;
3) plan measures to control the number of harmful fauna

Prerequisites

Biotechnological and breeding of game birds

Postrequisites

Forest legislation

Protection of animals and birds

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

Short description of discipline

The discipline studies the compatibility of animal groups, factors of hunting animals and birds; measures to protect useful fauna; habitat of forest animals and birds; the importance of conservation, reproduction and rational use of wildlife; distribution and causes of changes in the number of forest animals and birds; forecasting, assessment of anthropogenic impact on natural components.

Purpose of studying of the discipline

The purpose of mastering the discipline is to study the species composition of forest birds and animals, their ecology and biology, population dynamics, distribution, biocenotic role and forestry significance; formation of biological knowledge in the field of protection and rational use of forest species of birds and animals.

Learning Outcomes

ON 7 Manage specially protected natural territories; carry out measures for the protection of animals and birds, in the fight against poaching, stray dogs, harmful animals and birds; analyze the effectiveness of the activities of national natural parks and reserves of Kazakhstan; develop and design projects of landscaping objects; apply a set of measures for the cultivation of flower, greenhouse trees, shrubs and ornamental plants; use natural territorial complexes of forests, methods of landscape research.

Learning outcomes by discipline

1) plan activities for the protection of animals and birds;
2) analyze measures to combat poaching, stray dogs, harmful animals and birds;
3) apply a set of measures to protect useful fauna

Prerequisites

Biotechnological and breeding of game birds

Postrequisites

Forest legislation

Inspection activities in hunting science

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

Short description of discipline

The discipline studies methods of preserving the biological properties of land; calculations of use and determination of the specific direction of the economy; determination of the carrying capacity of the territory; preparation of a hunting map of the object; conditions, regime of humidification; regulation of drainage of forests, swamps; laying of fodder fields; security, economic measures.

Purpose of studying of the discipline

Mastering of theoretical knowledge and practical skills by future specialists in the implementation of control over the use of hunting grounds; organization of work on the protection, maintenance of the number and rational use of resources of hunting animals.

Learning Outcomes

ON 9 To make taxational descriptions of plantings; to analyze and use information about the state of forests; to plan environmental protection measures on the territory of nature reserves, parks, reserves; to apply technological processes of logging operations; apply modern concepts of nature protection and rational use of natural resources; get different types of side use; organize economically sustainable forest management.

Learning outcomes by discipline

1) use the results of accounting work, data on production in the control of seasonal hunting activities;
2) evaluate the activities of hunting farms;
3) effectively use the hunting grounds, master the methods of preserving the biological properties of the grounds;

Prerequisites

Forest Management

Postrequisites

Production practice 3

Forest commodity science

Discipline cycle	Profiling discipline

Course	4
Credits count	5
Knowledge control form	Examination

Short description of discipline
The discipline studies the classification, standardization of the quality of materials; methods of accounting, control, evaluation of goods in accordance with GOST standards; causes of defects, their impact on the quality of wood; determination of wood species, advantages, disadvantages; thermal decomposition of wood, bark; hydrolysis and yeast production; cutting wood spirally; processing for cellulose, wood pulp.

Purpose of studying of the discipline
Professional training of forestry specialists in the field of studying the structure, properties and defects of wood that form the consumer properties of forest materials and products obtained from the trunk, roots and crown of a tree, the basics of standardization of forest products, commodity science fundamentals of product quality management.

Learning Outcomes
ON 5 Use machines, machine-tractor fleet and technological processes in forestry and agriculture; use ways to increase the efficiency of aggregates, the development of power plants; use the theory of cutting logs for sawn products; use the forms of whips, logs and methods for determining their volumes; apply heat treatment processes and their technologies; apply classifications and standardization of forest products in accordance with GOST standards; to determine resource-saving technologies in logging production.

Learning outcomes by discipline
1) identify wood defects, their causes and impact on wood quality;
2) determine the type of wood by its appearance and microscopic structure;
3) own the basic methods for determining the quantity and quality of timber, the organizational and legal framework for standardization and certification of products.

Prerequisites
Forest Management

Postrequisites
Production practice 3

Forest management

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

Short description of discipline
The discipline studies the management, planning of forestry development; the structure of forest management bodies; calculation of the permissible amount of forest use; land, property relations; cadastral valuation and registration of real estate; land monitoring; conservation of valuable natural objects; preservation of the forest environment; forest dynamics in the conduct of economic activity; legal regulation of forest use.

Purpose of studying of the discipline
The purpose of teaching the discipline "Forest management and forest resources" is to assimilate the theoretical and methodological foundations of the ecological and economic approach to forest management, practical criteria, indicators of sustainable forest management and forest management.

Learning Outcomes
ON 9 To make taxational descriptions of plantings; to analyze and use information about the state of forests; to plan environmental protection measures on the territory of nature reserves, parks, reserves; to apply technological processes of logging operations; apply modern concepts of nature protection and rational use of natural resources; get different types of side use; organize economically sustainable forest management.

Learning outcomes by discipline
1) knows the structure of forest management bodies;
2) predicts the impact of economic activity on the productivity and useful functions of the forest;
3) has the skills to calculate the allowable amount of forest use.

Prerequisites
Forest Management

Postrequisites
Final examination

Hydrothermal wood processing and protection

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

Short description of discipline
The discipline studies the thermal properties of wood; the technological process of hydrothermal treatment of wood; environmental parameters, indicators of wood properties; the duration of moisture, heat treatment, conditioning of wood in the chamber; the values of the stack filling coefficient; design of drying shops; wood protection products; calculation of the processes of heating, thawing wood.

Purpose of studying of the discipline
To give the student the necessary theoretical knowledge and practical skills in the field of hydrothermal wood processing: the ability to use technical means to measure the main parameters of the technological process; the ability to analyze the technological process as an object of management.

Learning Outcomes
ON 5 Use machines, machine-tractor fleet and technological processes in forestry and agriculture; use ways to increase the efficiency of aggregates, the development of power plants; use the theory of cutting logs for sawn products; use the forms of whips, logs and methods for determining their volumes; apply heat treatment processes and their technologies; apply classifications and standardization of forest products in accordance with GOST standards; to determine resource-saving technologies in logging production.

Learning outcomes by discipline
1) knows the stages of the technological process of hydrothermal treatment of wood that affect the formation of a specific characteristic of wood;
2) determines the parameters of the environment and indicators of the properties of wood during the course of hydrothermal treatment processes;
3) has the skills to use control and measuring equipment, design installations for heat treatment and drying of wood and conduct technological processes

Prerequisites
Forest Management

Postrequisites
Production practice 3

Technology and equipment of sawmill production

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

Short description of discipline
The discipline studies the dimensional and qualitative characteristics of raw materials, lumber and blanks; the creation of imitation, mathematical models of the forms of whips and logs; the organization of woodworking industries; methods of logging, timber transport and woodworking industries; design of technological processes; mechanisms of woodworking industries; modern composition of the timber industry.

Purpose of studying of the discipline
The purpose of studying the discipline "Technology and equipment of sawmilling production" is to form students` systematized knowledge, skills and abilities in the field of theory and practice of sawmilling production, development and rational application of technological processes, research of the technological process of obtaining lumber and operational characteristics of equipment.

Learning Outcomes
ON 5 Use machines, machine-tractor fleet and technological processes in forestry and agriculture; use ways to increase the efficiency of aggregates, the development of power plants; use the theory of cutting logs for sawn products; use the forms of whips, logs and methods for determining their volumes; apply heat treatment processes and their technologies; apply classifications and standardization of forest products in accordance with GOST standards; to determine resource-saving technologies in logging production.

Learning outcomes by discipline
1) organize the work of woodworking industries;
2) to ensure the implementation of technological processes of logging, timber transportation and woodworking industries;
3) design and implement the implementation of technological processes of woodworking industries as part of the timber industry complex

Prerequisites
Forest management

Postrequisites
Pre-graduate practice

Wood processing technology and commodity science

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

Short description of discipline
The discipline studies equipment, tools used in wood processing; artistic finishing, quality control; manufacturing of parts, assembly of mechanisms; decorative processing of objects made of wood; means of information, automated systems; analysis of the causes of defects; defects in production; process control, production of fibrous semi-finished products; production of paper, cardboard, fiberboard; forest chemical products.

Purpose of studying of the discipline
The purpose of this course is to provide students with professional training of forestry specialists in the field of wood processing technology, which includes the technology of sawmilling, hydrothermal wood processing, technology of integrated use of wood.

Learning Outcomes
ON 5 Use machines, machine-tractor fleet and technological processes in forestry and agriculture; use ways to increase the efficiency of aggregates, the development of power plants; use the theory of cutting logs for sawn products; use the forms of whips, logs and methods for determining their volumes; apply heat treatment processes and their technologies; apply classifications and standardization of forest products in accordance with GOST standards; to determine resource-saving technologies in logging production.

Learning outcomes by discipline

Prerequisites
Forest Management

Postrequisites
Production practice 3

Hunting management in modern conditions

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

Short description of discipline
The discipline studies the classification of hunting farms; features of commercial, sports farms; gross, marketable products; about the hunting service of hunting farms; creation of favorable conditions for habitat in the grounds; organization of certain types of hunting; methods of combined hunting; legislative acts in the field of hunting, safety at accounting work, various types of hunting.

Purpose of studying of the discipline
The purpose of mastering the discipline is to form students` scientific worldview on the management and management of hunting farms in modern conditions.

Learning Outcomes
ON 10 Apply the classification of hunting farms: commercial and sports; possess the main legislative acts in the field of hunting and the Forest Code in the Republic of Kazakhstan; own the main legislative acts of the Republic of Kazakhstan in the field of hunting; use the results of accounting work, data on production during seasonal hunting events; possess the features of biology, distribution of commercial animals and birds; apply the features of zoogeographic distribution of representatives of hunting commercial animals and birds; use an algorithm of actions when detecting violations of andatory requirements in the field of hunting and conservation of hunting resources.

Learning outcomes by discipline
- develop long- term plans, calculate the effectiveness of various areas and specializations of hunting farms, basic regulatory requirements for the use of fixed, working and labor resources;
- evaluate the research work of the environment in specially protected natural areas;
- use the methodology for calculating economic indicators: cost, profitability, capital security, etc.
- protect commercial and hunting artiodactyl animals in extreme conditions (weather, fodder, etc.).

Prerequisites
Forest Management

Postrequisites
Production practice 3

Forest legislation

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

Short description of discipline
The discipline studies a set of regulatory legal acts; regulation of forest relations; forest Code - the central act of the forest legislation system; use of forest fund lands; state forest control; registration of forest declarations; forest management methods; state forest control; preservation of forests of high environmental value.

Purpose of studying of the discipline
The purpose of the discipline is to form a system of theoretical knowledge and practical skills among students on issues of regulatory regulation in the field of use, protection, protection, reproduction of forests, as well as forest management, forest
planning, ownership rights to forest plots, powers of authorities and local governments in the field of forest relations and responsibility for violation of forest legislation.

Learning Outcomes
ON 10 Apply the classification of hunting farms: commercial and sports; possess the main legislative acts in the field of hunting and the Forest Code in the Republic of Kazakhstan; own the main legislative acts of the Republic of Kazakhstan in the field of hunting; use the results of accounting work, data on production during seasonal hunting events; possess the features of biology, distribution of commercial animals and birds; apply the features of zoogeographic distribution of representatives of hunting commercial animals and birds; use an algorithm of actions when detecting violations of andatory requirements in the field of hunting and conservation of hunting resources.

Learning outcomes by discipline
1) knows the specifics of regulation of forest relations, state forest control and supervision of the use, protection, protection and reproduction of forests;
2) is able to issue forest declarations in accordance with the requirements of new regulatory legal acts, independently acquires new legal knowledge;
3) owns methods of forest management, state forest control; preservation of forests of high conservation value; state forest inventory, forest management, state cadastral registration of forest plots.

Prerequisites
Bases of economics, law and ecological knowledge

Postrequisites
Pre-graduate practice

Organization of inturohota

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

Short description of discipline
The discipline studies the development of intro- hunting fishing; foreign experience in hunting; zoogeographic distribution of representatives of hunting, mmercial animals, birds; scientific research, reproduction, use of wildlife; evaluation of various groups of trophies; storage, transportation of captured animals in winter, summer; killing of wounded; development of hunting tourism; primary processing, preparation of hunting trophies.
Purpose of studying of the discipline
The main purpose of studying the discipline is to broaden the horizons and train the ability to navigate in the business sphere, the ability to conduct business correspondence and negotiations.
Protection of animals and birds
Forest management
Learning Outcomes
ON 10 Apply the classification of hunting farms: commercial and sports; possess the main legislative acts in the field of hunting and the Forest Code in the Republic of Kazakhstan; own the main legislative acts of the Republic of Kazakhstan in the field of hunting; use the results of accounting work, data on production during seasonal hunting events; possess the features of biology, distribution of commercial animals and birds; apply the features of zoogeographic distribution of representatives of hunting commercial animals and birds; use an algorithm of actions when detecting violations of andatory requirements in the field of hunting and conservation of hunting resources.
Learning outcomes by discipline
1) own the main legislative acts of the Republic of Kazakhstan in the field of hunting; apply the features of the zoogeographic distribution of representatives of hunting game animals and birds;
2) determine the direction of hunting management, develop hunting tourism and foreign hunting;
3) apply domestic and foreign experience in hunting management;
Prerequisites
Forest Management
Postrequisites
Production practice 3

Rationing the use of hunting resources

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

Short description of discipline
The discipline studies the management of hunting animal populations; natural productivity of hunting grounds; organizational, economic and biological features; systems of rational use of hunting animal resources; interests of hunters; controlled hunting withdrawal of animals; obtaining the maximum amount of products; the size of biological and economic gains; the dynamism of the hunting fauna and fishing standards.
Purpose of studying of the discipline
The purpose of studying the discipline is to form students` concepts of project activities in order to organize scientifically - based management of hunting resources and farming.

Learning Outcomes
ON 10 Apply the classification of hunting farms: commercial and sports; possess the main legislative acts in the field of hunting and the Forest Code in the Republic of Kazakhstan; own the main legislative acts of the Republic of Kazakhstan in the field of hunting; use the results of accounting work, data on production during seasonal hunting events; possess the features of biology, distribution of commercial animals and birds; apply the features of zoogeographic distribution of representatives of hunting commercial animals and birds; use an algorithm of actions when detecting violations of andatory requirements in the field of hunting and conservation of hunting resources.
Learning outcomes by discipline
1) rationally manage and use animal populations.
2) to develop and carry out activities to improve the productivity and productivity of hunting grounds, to use hunting grounds effectively, to master the methods of preserving the biological properties of the grounds.
3) apply the features of the zoogeographic distribution of representatives of hunting game animals and birds
Prerequisites
Forest Management
Postrequisites
Production practice 3

Hunting and commercial bioresources

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

Short description of discipline
The discipline studies production and technological biological work; methods of accounting for the number of commercial animals; methods of studying wild game; habitats of terrestrial vertebrates of various classes; climatic features of the seasons within different subzones; limiting distribution of representatives of different classes; number, dynamics, factors affecting the state of resources.
Purpose of studying of the discipline
The purpose of mastering the discipline is to take into account and evaluate hunting and fishing resources; to establish the habitat of wild animals and birds, their territorial location, numbers in various lands for subsequent hunting activities and planning of hunting use.

Learning Outcomes
ON 10 Apply the classification of hunting farms: commercial and sports; possess the main legislative acts in the field of hunting and the Forest Code in the Republic of Kazakhstan; own the main legislative acts of the Republic of Kazakhstan in the field of hunting; use the results of accounting work, data on production during seasonal hunting events; possess the features of biology, distribution of commercial animals and birds; apply the features of zoogeographic distribution of representatives of hunting commercial animals and birds; use an algorithm of actions when detecting violations of andatory requirements in the field of hunting and conservation of hunting resources.
Learning outcomes by discipline
1) apply the acquired knowledge to organize the accounting of hunting stocks and other biological resources
2) plan and organize the conduct of accounting work;
3) monitor the number of valuable game animals
Prerequisites
Forest Management
Postrequisites
Production practice 3

Ecology of game animals and birds

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

Short description of discipline
The discipline studies the structure, physiology, behavior, ecology of commercial species; classification of ecological features of commercial animals; zoogeographic distribution of representatives of hunting commercial animals, birds; seasonal hunting activities; daily biorhythms, seasonal phenomena in the life, reproduction of commercial animals; legislative framework in the field of protection, reproduction of hunting commercial animals; artificial wild breeding.
Purpose of studying of the discipline
The purpose of mastering the discipline is to study the basics of hunting and hunting studies, familiarization with the morphobiological features of the main types of hunting and commercial species of animals and birds, methods of hunting, biotechnical measures and legislative bases in hunting.
Learning Outcomes
ON 10 Apply the classification of hunting farms: commercial and sports; possess the main legislative acts in the field of hunting and the Forest Code in the Republic of Kazakhstan; own the main legislative acts of the Republic of Kazakhstan in the field of hunting; use the results of accounting work, data on production during seasonal hunting events; possess the features of biology, distribution of commercial animals and birds; apply the features of zoogeographic distribution of representatives of hunting commercial animals and birds; use an algorithm of actions when detecting violations of andatory requirements in the field of hunting and conservation of hunting resources.
Learning outcomes by discipline
1) apply the classification of ecological characteristics of game animals; apply the features of the zoogeographic distribution of representatives of hunting game animals and birds; use an algorithm of actions in identifying violations of mandatory requirements in the field of hunting and conservation of hunting resources.
2) operate with the peculiarities of ecology, biology, distribution of game animals and birds during seasonal hunting events;
3) Organize professional activities on the basis of modern methods of ecology of game animals and birds;
Prerequisites
Forest Management
Postrequisites
Production practice 3

Forest economy

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

Short description of discipline
The discipline studies the use of production assets and the economic efficiency of the forest industry in a market economy system; the production cycle of forest cultivation; forestry financing; principles and methods of indicative planning; labor resources and labor productivity; remuneration of employees; technical labor rationing; prices and pricing; economic and social development of state forestry institutions.
Purpose of studying of the discipline
The purpose of studying the discipline is to provide theoretical and practical training of specialists in the economics of the industry to develop and make effective decisions at different levels of forest management to balance supply and demand for products and services in a market economy.

Learning Outcomes
ON 11 To evaluate the worlds forest resources to evaluate balneological and mud- healing recreational resources own forest management documentation to manage the main production funds, and the economic efficiency of their use own the structure of the industry, evaluate competition in the commodity markets, antimonopoly legislation and concentration in the industry understand the role of the forest complex in the countrys economy, be guided by forest legislation.
Learning outcomes by discipline

1) knows the issues of financing forestry, and the production cycle of forest growing;
2) use the principles and methods of indicative planning, the procedure for developing and approving the main indicators of the economic and social development of state institutions and their divisions;
3) makes a feasibility study of the projected forest management activities.

Prerequisites
Forest Management

Postrequisites
Final examination

Economics and management at the enterprise (forest complex)

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

Short description of discipline
The discipline studies methods of taxation in the forest industry; use of enterprise resources; ergonomic indicators; balance of production capacities, average annual production capacity; calculation methods; estimation of demand, costs; strategy of periodic discounts; technological maps, their role in the organization of production; management of the production process; classifications innovations in management.

Purpose of studying of the discipline
The purpose of the study is to form students` knowledge about the role of the forest complex in the national economy of the country and its relationship with other industries; mastering the methodological foundations of choosing rational solutions when solving economic problems at the level of the forest complex; developing skills for conducting economic analysis of the costs and results of forestry facilities; evaluating the effectiveness of the organization in the forest complex.

Learning Outcomes
ON 11 To evaluate the worlds forest resources to evaluate balneological and mud- healing recreational resources own forest management documentation to manage the main production funds, and the economic efficiency of their use own the structure of the industry, evaluate competition in the commodity markets, antimonopoly legislation and concentration in the industry understand the role of the forest complex in the countrys economy, be guided by forest legislation.

Learning outcomes by discipline
1) knows the methodology for determining the economic efficiency of projects;
2) is able to calculate the technical and economic indicators of the enterprise;
3) possesses the skills of analysis and planning in professional activities.

Prerequisites
Forest Management

Postrequisites
Production practice 3

Industry economics

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

Short description of discipline
The discipline studies the investment and forestry activities of the forestry industry; taxation of enterprises; distribution of the planned volume of goods, works, services between groups of consumers in the market; personnel, labor productivity; nomenclature, assortment and quality of products; indicators of maintainability, reliability, durability, preservation, manufacturability; indicators of standardization and unification.

Purpose of studying of the discipline
The main objectives of studying the discipline "Industry Economics" are the formation of knowledge on the economic problems of enterprise development, the development of economic thinking and a sense of responsibility for the results of the production and financial activities of the enterprise.

Learning Outcomes
ON 11 To evaluate the worlds forest resources to evaluate balneological and mud- healing recreational resources own forest management documentation to manage the main production funds, and the economic efficiency of their use own the structure of the industry, evaluate competition in the commodity markets, antimonopoly legislation and concentration in the industry understand the role of the forest complex in the countrys economy, be guided by forest legislation.

Learning outcomes by discipline
1) knows the economic categories that reveal the essence of the economy of the agro-industrial complex, legislative and legal acts regulating the activities of the agro-industrial complex;
2) analyzes the initial data necessary for the economic analysis of the enterprises of the agro-industrial complex;
3) has the skills of self-mastering new knowledge and ways of transferring acquired knowledge and skills to new economic conditions.

Prerequisites
Forest Management

Postrequisites
Final examination

World forest resources

Discipline cycle	Profiling discipline

Course	4
Credits count	5
Knowledge control form	Examination

Short description of discipline
The discipline studies the principles of allocation of forest resources of the countries of the world; special geographical maps; geographical features of countries; exhaustible and inexhaustible, replaceable and irreplaceable, primary and secondary, simple and integral natural resources; density of concentration of resources; combination of resources; availability of resources; resource cycles; potential natural vulnerability; information and analytical references.

Purpose of studying of the discipline
formation of students` understanding of the types, conditions of education and renewal of natural resources, responsibility for their rational use in the world community, respect for the environment.

Learning Outcomes
ON 11 To evaluate the worlds forest resources to evaluate balneological and mud- healing recreational resources own forest management documentation to manage the main production funds, and the economic efficiency of their use own the structure of the industry, evaluate competition in the commodity markets, antimonopoly legislation and concentration in the industry understand the role of the forest complex in the countrys economy, be guided by forest legislation.

Learning outcomes by discipline
1) knows the features of natural resources, their location on the territory, resource availability of forest natural resources of the countries of the world, cross-border problems related to natural resources;
2) analyzes the principles of the allocation of forest resources of the countries of the world, special geographical maps, evaluates the geographical features of countries, prepares information and analytical references;
3) has the skills of situational analysis in the field of geography, the use of various territories in terms of assessing their resource availability.

Prerequisites
Forest crops

Postrequisites
Final examination

Recreational resources and tourism

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

Short description of discipline
The discipline studies the types of recreational activities; recreational development; tourist resource; assessment of the aesthetics of landscapes; hydrological conditions of recreation organization; tourist and recreational potential of the territory; territorial recreational systems; recreational and recreational sphere; types of tourist nature management; loads on natural complexes and methods of their determination; recreational district formation and zoning.

Purpose of studying of the discipline
The purpose of studying the discipline is to study the conditions of formation, development and placement of territorial and recreational complexes, familiarization with the systems. organizing the activities of the population to restore physical and spiritual strength: recreation, wellness and spa treatment, tourist travel.

Learning Outcomes
ON 11 To evaluate the worlds forest resources to evaluate balneological and mud- healing recreational resources own forest management documentation to manage the main production funds, and the economic efficiency of their use own the structure of the industry, evaluate competition in the commodity markets, antimonopoly legislation and concentration in the industry understand the role of the forest complex in the countrys economy, be guided by forest legislation.

Learning outcomes by discipline
1) describe the forest resources of the world;
2) to evaluate balneological and mud therapy recreational resources;
3) consider the possibilities of developing tourism in Kazakhstan

Prerequisites
Forest crops

Postrequisites
Production practice 3

Logging technology and wood science

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

Short description of discipline
The discipline design and implementation of allotment of forest plots; taxation; heat- producing and vapor- forming ability of wood; texture, fibrousness, pattern and shine of wood; specific weight of wood substance and bulk weight of wood; porosity of wood; time of cutting and debarking; abnormal coloring of wood; parasitic defects; planning and control of logging operations.

Purpose of studying of the discipline
The purpose of studying the discipline is to gain knowledge and skills in the field of types and properties of wood products and its processing processes.

Learning Outcomes
ON 5 Use machines, machine-tractor fleet and technological processes in forestry and agriculture; use ways to increase the efficiency of aggregates, the development of power plants; use the theory of cutting logs for sawn products; use the forms of whips, logs and methods for determining their volumes; apply heat treatment processes and their technologies; apply classifications and standardization of forest products in accordance with GOST standards; to determine resource-saving technologies in logging production.
Learning outcomes by discipline
1) design and carry out the allotment of forest plots for carrying out activities for the use of forests.
2) to carry out taxation of felled, separately growing trees and forest plantations.
3) plan and control the work on the use of forests for the purpose of harvesting wood and other forest resources and manage them.
Prerequisites
Forest crops
Postrequisites
Final examination

Radiation monitoring of forests

Discipline cycle	Basic disciplines
Course	4
Credits count	3
Knowledge control form	Examination

Short description of discipline
The discipline studies radioactive radiation; zones of radioactive contamination; accumulation of radionuclides by woody plants of forest biogeocenoses; forestry and edaphic factors; accumulation of radionuclides in forest food products; interaction of radioactive radiation with matter accumulation of radionuclides by forest animals; assessment of radionuclide stocks in the main components of forest biogeocenoses.
Purpose of studying of the discipline
preparation of students for practical activities in the field of organization of forestry production in the conditions of radiation pollution of forest biogeocenosis
Learning Outcomes
ON 8 To determine the level of soil fertility, their compliance with the requirements of forest crops; to use methods, technologies for monitoring land and soil bonity; to possess methods of protection, management of land resources; to determine the types of soil erosion and deflation; to control and improve the land reclamation condition; to combat soil salinization during the operation of irrigation systems; to assess the radioecological state of forests; to apply background monitoring of the content of pollutants in natural environments; to measure wind speeds and directions, soil, air and plant temperature.
Learning outcomes by discipline
1) knows the mechanisms of the effects of radioactive radiation on living organisms;
2) determines the intensity levels and the degree of danger of radioactive radiation;
3) owns the basic research methods in the field of radiation ecology of the forest.
Prerequisites
Digitalization in forestry
Postrequisites
Final examination

Radioecological rationing in forestry

Discipline cycle	Basic disciplines
Course	4
Credits count	3
Knowledge control form	Examination

Short description of discipline
The discipline studies forestry methods of forest protection; accounting, evaluation of indicators of the radio ecological state of forests; forecast of changes in the state of the ecosystem; biological, chemical, physical protection of forests; preparation of a radioecological report in the prescribed form; types of environmental impacts of economic activities; health and sanitary measures.
Purpose of studying of the discipline
The purpose of teaching the discipline is the assimilation by students of the assessment of the radioecological state of forests, under the influence of anthropogenic factors at the moment.

Learning Outcomes
ON 8 To determine the level of soil fertility, their compliance with the requirements of forest crops; to use methods, technologies for monitoring land and soil bonity; to possess methods of protection, management of land resources; to determine the types of soil erosion and deflation; to control and improve the land reclamation condition; to combat soil salinization during the operation of irrigation systems; to assess the radioecological state of forests; to apply background monitoring of the content of pollutants in natural environments; to measure wind speeds and directions, soil, air and plant temperature.
Learning outcomes by discipline
1) knows the environmental legislation of the Republic of Kazakhstan, the main regulatory legal acts in the field of environmental protection;
2) takes into account the indicators characterizing the radioecological state of the environment in accordance with the requirements of regulatory legal acts in the field of environmental protection;
3) draws up radioecological reports in the prescribed form.
Prerequisites
Digitalization in forestry

Postrequisites
Final examination

Forest meteorology

Discipline cycle	Profiling discipline
Course	4
Credits count	3
Knowledge control form	Examination

Short description of discipline
The discipline studies the composition, structure, properties of the atmosphere; weather- forming factors; methods of research and organization of meteorological observations; formation of the radiation, thermal regime of the Earth`s surface and atmosphere; methods of climate assessment for changes and fluctuations in climate and microclimate; wind speed and direction; amount and intensity of precipitation; weather conditions of their impact on the environment; calculation of complex agro-climatic indicators.

Purpose of studying of the discipline
The most important task of forest meteorology is the study of meteorological conditions and climate that characterize the physical state of the environment in which the forest lives.

Learning Outcomes
ON 8 To determine the level of soil fertility, their compliance with the requirements of forest crops; to use methods, technologies for monitoring land and soil bonity; to possess methods of protection, management of land resources; to determine the types of soil erosion and deflation; to control and improve the land reclamation condition; to combat soil salinization during the operation of irrigation systems; to assess the radioecological state of forests; to apply background monitoring of the content of pollutants in natural environments; to measure wind speeds and directions, soil, air and plant temperature.

Learning outcomes by discipline
To determine the level of soil fertility, their compliance with the requirements of forest crops; to use methods, technologies for monitoring land and soil bonity; to possess methods of protection, management of land resources; to determine the types of soil erosion and deflation; to control and improve the land reclamation condition; to combat soil salinization during the operation of irrigation systems; to assess the radioecological state of forests; to apply background monitoring of the content of pollutants in natural environments; to measure wind speeds and directions, soil, air and plant temperature.

Prerequisites
Digitalization in forestry

Postrequisites
Production practice 3