CATALOG OF ELECTIVE DISCIPLINES

6B07 - Engineering, manufacturing and construction industries
(Code and classification of the field of education)

6B071 - Engineering and Engineering affairs
(Code and classification of the direction of training)

0710
(Code in the International Standard Classification of Education)

B064 - Mechanics and metal working
(Code and classification of the educational program group)

6B07109 - Food Engineering
(Code and name of the educational program)

bachelor
(Level of preparation)

set of 2024

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Developed

By the Academic Committee of the EP
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Reviewed

At the meeting of the Commission on Academic Quality of the Faculty of Engineering and Technology
Protocol № 3 15.01. 2024
At the meeting of the Commission on Academic Quality of the Research School of Food Engineering
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Protocol № 1 06.06.2024

Approved

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

Descriptive geometry and engineering graphics

Discipline cycle	Basic disciplines
Course	1
Credits count	7
Knowledge control form	Examination

Short description of discipline
In this course, methods of projection drawing are considered, which allow solving the issues of the image of parts and assemblies of technological machines with the help of views, sections, sections. The rules of design and execution of drawings in accordance with the requirements of ISO and ESCD are studied. The study of the discipline allows you to develop the spatial and logical thinking of a specialist necessary for the development of drawings when creating new technological equipment.

Purpose of studying of the discipline
Development of spatial imagination and logical thinking skills; study of the theoretical foundations of the construction of various images on the plane; ability to develop and drawings available to read them to meet the requirements of international standards ISO and USDD (Unified system for design documentation).

Learning Outcomes
ON3 To develop design, technical, design and technological documentation, to carry out its expertise and feasibility study of design solutions

Learning outcomes by discipline
1) Applies projection drawing methods to depict parts and assemblies of technological machines
2) Performs images, cuts and sections in drawings, detailing of the assembly drawing
3) Develops and reads drawings of various objects taking into account the requirements of international standards ISO and USDD

Prerequisites
School course

Postrequisites
Engineering Technology Computer-Aided Design of Technological Machines Fundamentals of industrial construction

Theoretical and Applied Mechanics

Discipline cycle	Basic disciplines
Course	1
Credits count	7
Knowledge control form	Examination

Short description of discipline
This course examines the elements of theoretical mechanics and the resistance of materials. The issues of statics, kinematics and dynamics are considered. The behavior of materials under tension, compression, bending and torsion is studied. Maximum and permissible voltages at various loads. Fundamentals of strength calculation for various types of deformation of working bodies of technological machines. As a result of the study, the student will be able to calculate and design standard components and parts of technological machines, evaluate their performance.

Purpose of studying of the discipline
Study of mechanical phenomena, general principles of design and construction, construction of models and calculation algorithms of technological machines, taking into account their main performance criteria, which is necessary when creating new or upgrading and reliable operation of existing equipment in the industry

Learning Outcomes
ON3 To develop design, technical, design and technological documentation, to carry out its expertise and feasibility study of design solutions

Learning outcomes by discipline
1) Applies the basic equations of resistance of materials
2) Designs mechanical transmissions
3) Performs calculation of parts and assemblies of mechanisms and machines

Prerequisites
School course

Postrequisites
Basics of construction and machine parts Calculation and design of technological equipment of the meat and dairy production Calculation and design of technological equipment of the food production

Theoretical mechanics

Discipline cycle	Basic disciplines
Course	1
Credits count	7
Knowledge control form	Examination

Short description of discipline
In this course, the sections statics, kinematics and dynamics are studied. Vector, coordinate and natural methods of specifying the movement of a point, determining the trajectory and acceleration of a point. Translational and rotational motion of a rigid body. The knowledge gained during the course will allow students to calculate the trajectories of movement, speed and acceleration of the main working bodies of technological machines and equipment during the design and development of their new samples. As a result of the training, the student will be able to make kinematic calculation schemes of machines, perform kinematic analysis of the mechanism of the machine, determine dynamic loads arising in machine parts.

Purpose of studying of the discipline
The purpose of studying the discipline "Theoretical Mechanics" is to study the general laws that govern the movement and equilibrium of

material bodies and the resulting interactions between bodies.

Learning Outcomes

ON3 To develop design, technical, design and technological documentation, to carry out its expertise and feasibility study of design solutions

Learning outcomes by discipline

1) Determines the dynamic loads that occur in machine parts
2) Performs kinematic analysis of the machine mechanism
3) Makes kinematic calculation schemes of machines

Prerequisites

School course

Postrequisites

Theory of mechanisms and machines Strength of materials Bases of calculation elements of machine

Theory of mechanisms and machines

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

Short description of discipline

In this course, the device and the principle of operation of flat lever mechanisms are studied. The method of kinematic calculation of the crank mechanism by analytical and graphical methods is studied; the method of constructing plans of speeds and accelerations; the device, the principle of operation and the basics of calculating cam mechanisms and gears. After completing the course, students will be able to apply standard methods of designing mechanical systems taking into account their operating conditions.

Purpose of studying of the discipline

Obtaining students knowledge in the field of calculations and the main stages of machine design, optimal calculation methods that contribute to the combination of reliable operation of mechanisms and machines.

Learning Outcomes

ON4 Apply standard methods of designing mechanical systems taking into account their operating conditions

Learning outcomes by discipline

1) Uses modern educational and information technologies to acquire new knowledge
2) Makes calculation and kinematic schemes of machines
3) Designs parts and assemblies of mechanisms and machines

Prerequisites

Interchangeability, standardization and technical measurements

Postrequisites

Basics of construction and machine parts Calculation and design of technological equipment of the meat and dairy production Calculation and design of technological equipment of the food production

Fundamentals of industrial construction

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

Short description of discipline

This course gives an idea of the types of industrial buildings of food production enterprises and their classification by spatial planning, functional, structural features, operating mode. Regulatory documents and SNiPs submitted for industrial buildings of food production. Development of building projects for food production. Calculation of costs for the construction and repair of buildings using modern building materials and structures, plumbing products.

Purpose of studying of the discipline

Give an idea of the kinds of industrial buildings and their classification by volume - planning, functional design features, operation.

Learning Outcomes

ON3 To develop design, technical, design and technological documentation, to carry out its expertise and feasibility study of design solutions

Learning outcomes by discipline

1) Designs buildings and structures of the food industry taking into account the peculiarities of food production technology
2) Draws up a plan for the placement of technological equipment
3) Draws up construction drawings and explanatory notes to them

Prerequisites

Descriptive geometry and engineering graphics

Postrequisites

Design engineering of meat and dairy industry enterprises Design engineering of food industry enterprises

Hydraulics

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

Short description of discipline

In this course, sections such as hydrostatics and hydrodynamics are studied. The laws of equilibrium and the laws of fluid motion are

considered. The basic equations of hydrodynamics are studied. Modes of fluid movement in pipes. Pressure losses to overcome hydraulic resistances along the length of the pipeline and in local resistances. Hydraulic calculation of the pipeline. The phenomenon of hydraulic shock. The outflow of liquids from the holes and nozzles. Hydraulic machines. As a result of the training, the student will understand the essence of the basic methods used in hydraulic research and apply them in professional activities, evaluate the pipeline system in terms of pressure drop and design a pump-pipeline system for liquid transportation.

Purpose of studying of the discipline

Obtaining theoretical knowledge in the field of hydraulics, the mastery of the methods of solving applied problems and practical skills in the application of the basic laws of hydraulics.

Learning Outcomes

ON2 Apply the basic laws of natural science disciplines for mastering technological processes in food production
ON5 To calculate hydraulic systems, water and heat supply systems

Learning outcomes by discipline

1) Uses basic and general knowledge in its subject area and applies their methods in various types of professional and social activities
2) Understands the essence of the basic methods used in hydraulic research
3) Evaluates the pipeline system in terms of pressure drop and designs a pump-pipeline system for liquid transportation

Prerequisites

Physics

Postrequisites

Hydropneumatic machines and drives Engineering of ventilation systems of meat and dairy industry enterprises Engineering of ventilation systems of food industry enterprises Physico-chemical methods of water preparation Power systems life support Bases of water supply, sewerage and thermal networks

Fluid dynamics and heat and mass transfer

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

Short description of discipline

This course studies the laws of hydro- gas dynamics and heat and mass transfer, the basics of energy conversion. The physical properties of liquids and gases are considered. The laws of equilibrium and dynamics of liquids and gases are studied; the method of calculation of pipelines; the first and second laws of thermodynamics; methods of heat transfer; the basic equation of heat transfer. As a result of studying the course, the student will be able to apply the basic laws of hydrogas dynamics and heat and mass transfer and carry out hydraulic and thermodynamic calculations of real processes and phenomena used in the food industry.

Purpose of studying of the discipline

Study of the laws of fluid dynamics and fundamentals of energy conversion, the laws of thermodynamics and heat and mass transfer

Learning Outcomes

ON2 Apply the basic laws of natural science disciplines for mastering technological processes in food production
ON5 To calculate hydraulic systems, water and heat supply systems

Learning outcomes by discipline

1) Uses basic and general knowledge in its subject area and applies their methods in various types of professional and social activities
2) Applies the basic laws of hydro-gas dynamics and heat and mass transfer
3) Performs hydraulic and thermodynamic calculations of real processes and phenomena used in the food industry

Prerequisites

Physics

Postrequisites

Hydropneumatic machines and drives Engineering of ventilation systems of meat and dairy industry enterprises Engineering of ventilation systems of food industry enterprises Physico-chemical methods of water preparation Power systems life support Bases of water supply, sewerage and thermal networks

Mechanization of loading and unloading and transport and storage operations

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

Short description of discipline

In this course, students will get acquainted with the basic structures and the principle of operation of lifting and transport machines and mechanisms used for loading and unloading and transport and storage operations carried out at food industry enterprises, acquire skills in calculating and designing lifting and transport machines and their components, will be able to critically evaluate the results obtained. Here we study continuous transport machines, cargo lifting mechanisms, mechanisms of movement of lifting machines.

Purpose of studying of the discipline

Learning the structures handling machines and mechanisms, the acquisition of skills in the construction of machines and units, mastering the methods of calculation and critical evaluation of the results.

Learning Outcomes

ON5 To calculate hydraulic systems, water and heat supply systems

Learning outcomes by discipline

1) Uses basic and general knowledge in its subject area and applies their methods in various types of professional and social activities
2) Analyzes the construction of lifting and transport machines and mechanisms
3) Selects effective schemes of mechanization of loading and unloading and transport and storage operations

Prerequisites

Physics

Postrequisites
Thermal and mass transfer processes and apparatus of food production Fundamentals of mathematical and computer modeling of technological processes Heat and Mass Transfer

Fluid and gas mechanics

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

Short description of discipline
This course covers the basic concepts and definitions of fluid mechanics; fluid and gas equilibrium equations; general equations of fluid and gas motion; continuity equation; Bernoulli equation for ideal and real fluid; modes of fluid and gas motion in pipes of various cross-sections; hydraulically smooth and hydraulically rough pipes; shock wave propagation velocity; motion two- phase flows. Upon completion of the training, the student will be able to apply the theoretical provisions of hydromechanics to solving practical problems, solve problems for calculating pipeline systems.
Purpose of studying of the discipline
Students receive theoretical knowledge in the field of fluid mechanics, hydraulic machines and other devices for processing and moving gaseous liquids, mastering methods for solving applied problems necessary for further study of special disciplines and practical activities in the specialty.
Learning Outcomes
ON2 Apply the basic laws of natural science disciplines for mastering technological processes in food production
ON5 To calculate hydraulic systems, water and heat supply systems
Learning outcomes by discipline
1) Uses basic and general knowledge in its subject area and applies their methods in various types of professional and social activities
2) Applies the theoretical provisions of hydromechanics to solving practical problems
3) Solves the problems of calculating pipeline systems
Prerequisites
Physics
Postrequisites
Hydropneumatic machines and drives Engineering of ventilation systems of meat and dairy industry enterprises Engineering of ventilation systems of food industry enterprises Physico-chemical methods of water preparation Power systems life support Bases of water supply, sewerage and thermal networks

Mechanical and hydro-mechanical processes and apparatus of food production

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

Short description of discipline
This course gives students knowledge about the general principles of calculation of technological processes and devices of food production; the driving forces of processes. The fundamentals of the theory of modeling and similarity are considered. Basic properties of raw materials and finished products. The classification and theoretical foundations of mechanical and hydromechanical processes are studied here; the device and the principle of operation of the devices. Students will acquire the skills of calculating mechanical and hydromechanical processes and apparatuses.
Purpose of studying of the discipline
The purpose of mastering the discipline "Mechanical and hydromechanical processes and devices of food production" is to provide students with the basics of knowledge in the field of technological processes, devices and machines, which a specialist (bachelor) will be able to apply in his further practical activities when working in the specialty.
Learning Outcomes
ON5 To calculate hydraulic systems, water and heat supply systems
Learning outcomes by discipline
1) Uses basic and general knowledge in its subject area and applies their methods in various types of professional and social activities
2) Classifies equipment for carrying out basic technological processes and performs calculations of mechanical and hydromechanical processes and apparatuses
3) Explains the technological processes of material processing with the indication of technological parameters for obtaining finished products
Prerequisites
Physics
Postrequisites
Thermal and mass transfer processes and apparatus of food production Fundamentals of mathematical and computer modeling of technological processes Heat and Mass Transfer

Reliability of technological machines

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

Short description of discipline
In this course, the main provisions of the theory of reliability of technological machines are studied. Estimated reliability indicators of

technological machines. Changes in the working capacity of the machine during operation and the reasons for its violation. Methods for determining the main indicators of reliability of technological machines. Calculation of the reliability of parts in the design of: shafts, tension joints, threaded joints, welded joints, bearings. Measures to ensure and improve the reliability of technological machines.

Purpose of studying of the discipline

Getting the students basic knowledge in the area of reliability of technological machines, hydraulic machines, and other devices for handling, feeding and handling of food.

Learning Outcomes

ON6 To carry out installation, operation and repair of technological machines and equipment

Learning outcomes by discipline

1) Assesses the probability of equipment failure, checking the remaining life of technological equipment
2) Develops measures to ensure and improve the reliability of technological machines in the process of their design, manufacture and operation
3) Performs standard calculations of the reliability of technological machines

Prerequisites

Technology of construction materials

Postrequisites

Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

Organization and planning of production

Discipline cycle	Basic disciplines
Course	2
Credits count	3
Knowledge control form	Examination

Short description of discipline

The discipline «Organization and production planning» gives different ideas about the basics of organization, industrial production planning, methods of evaluating its effective activities. As well as the analysis and forecast of production risks and losses of the enterprise, including ways to eliminate them as soon as possible. Students will gain knowledge and skills in the field of implementation, organization and planning of industrial production of the enterprise.

Purpose of studying of the discipline

The purpose of studying the discipline "Organization and planning of production" is to study the theoretical and methodological foundations of the organization and planning of production and production infrastructure at enterprises.

Learning Outcomes

ON8 Develop projects of workshops and sites of industrial enterprises

Learning outcomes by discipline

1) Demonstrates the ability to work effectively both individually and as a team member;
2) Organizes the work of small labor collectives of performers of production tasks;
3) Draws up technical documentation on the planning and organization of production, as well as on the established reporting according to approved forms.

Prerequisites

Bases of economics, law and ecological knowledge

Postrequisites

Prediploma practice Manufacturing practice III

Interchangeably

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

Short description of discipline

In this course, the basics of interchangeability are studied; the concepts of the tolerance and fit system; the principles of functional interchangeability of various connections: cylindrical, conical, threaded keyway, spline, gear and worm gears, rolling bearings. Methods and means of their control. Undulation, roughness, deviations from the shape and location of surfaces and their control. The main provisions of the theory and practice of calculation and compilation of dimensional circuits. As a result of the training, the student demonstrates the ability to ensure the manufacturability of products and their manufacturing processes, monitors compliance with technological discipline in the manufacture of products, uses structural materials used for maintenance and routine repair of technological machines and equipment, applies mathematical methods and laws of physics in design.

Purpose of studying of the discipline

Gaining knowledge about interchangeability, tolerances and landings, methods and means of their control.

Learning Outcomes

ON6 To carry out installation, operation and repair of technological machines and equipment

Learning outcomes by discipline

1) Shows the ability to ensure the manufacturability of products and their manufacturing processes, monitors compliance with technological discipline in the manufacture of products
2) Uses structural materials used for maintenance and routine repair of technological machines and equipment
3) Applies mathematical methods and laws of physics in the design

Prerequisites

Descriptive geometry and engineering graphics

Postrequisites

Basics of construction and machine parts

Bases of calculation elements of machine

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

Short description of discipline
The course is aimed at obtaining students` knowledge on the calculation of machine elements. The course examines the classification of technological machines, methods of designing elements of technological machines, taking into account their operating conditions. The study of the device, the principle of operation and the main computational dependencies of crank mechanisms, Maltese cross mechanisms, ratchet, cam mechanisms. The study of the device and the principle of operation of gear, belt, chain, friction gears. As a result of the training, the student will be able to classify the main mechanisms, perform kinematic analysis of mechanisms and machines, and calculate them.

Purpose of studying of the discipline
Obtaining knowledge in the field of calculating the elements of machines and apparatuses.

Learning Outcomes
ON4 Apply standard methods of designing mechanical systems taking into account their operating conditions

Learning outcomes by discipline
1) Uses modern educational and information technologies to acquire new knowledge
2) Classifies the main mechanisms, performs their calculation
3) Performs kinematic analysis of mechanisms and machines

Prerequisites
Interchangeability, standardization and technical measurements

Postrequisites
Basics of construction and machine parts

Computer-Aided Design of Technological Machines

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

Short description of discipline
The course studies the system of automatic design of technological machines. Students get the skills to work with the Compass graphic editor. Performing views, cuts and sections. Application of hatching and dimensioning and symbols. Perform working drawings of parts in 2D and 3D formats and assembly drawings of technological machines, draw up specifications for assembly drawings. They receive the necessary knowledge and skills for the development of design documentation.

Purpose of studying of the discipline
Getting students the basics of knowledge in the field of computer-aided design of technological machines.

Learning Outcomes
ON3 To develop design, technical, design and technological documentation, to carry out its expertise and feasibility study of design solutions

Learning outcomes by discipline
1) Uses the basic methods, methods and means of obtaining, storing and processing information, computer skills as a means of information management
2) Analyzes and synthesizes spatial forms
3) Applies information technology in process design

Prerequisites
Descriptive geometry and engineering graphics

Postrequisites
Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

The quality management system

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

Short description of discipline
This course studies the quality management system at food industry enterprises. The main quality indicators for raw materials, semi-finished products and finished products are presented. The basics of standardization, metrology and certification are considered. Requirements of international ISO standards for quality management and quality elements. The legislative and regulatory framework of standardization and metrology of the Republic of Kazakhstan is being studied. The effect of quality management system implementation at the enterprise is evaluated.

Purpose of studying of the discipline
Gaining knowledge about quality management system.

Learning Outcomes
ON6 To carry out installation, operation and repair of technological machines and equipment

Learning outcomes by discipline
1) Uses information technology to improve the quality management system
2) Solves problems in quality management

3) Provides regulatory support of the quality management system

Prerequisites

Technology of construction materials

Postrequisites

Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

Strength of materials

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

Short description of discipline

This course examines the behavior of shafts, axles, wheels, pulleys and other parts of technological machines in a loaded state. Methods of plotting under various types of loading are described. The most important concepts of force, moment, stress and deformation are considered. The mechanical properties and characteristics of the material under tension, compression, bending, torsion are studied. Methods of calculations for strength, fatigue, stiffness, stability are described.

Purpose of studying of the discipline

Obtaining knowledge about the methods of calculations carried out when creating machines and devices with a given reliability and durability, about the choice of rational and economical structures and machine parts, about the use of new materials.

Learning Outcomes

ON4 Apply standard methods of designing mechanical systems taking into account their operating conditions

Learning outcomes by discipline

1) Uses modern educational and information technologies to acquire new knowledge
2) Applies calculation methods for strength, rigidity and stability of structural elements
3) Examines the stressed and deformed state of the body at a given static, dynamic and variable loads

Prerequisites

Interchangeability, standardization and technical measurements

Postrequisites

Basics of construction and machine parts Calculation and design of technological equipment of the meat and dairy production Calculation and design of technological equipment of the food production

Engineering Technology

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

Short description of discipline

In this course, the basics of food engineering are studied. Materials used to create technological machines and equipment. Types, structure and principle of operation of metalworking machines. The main technological operations for processing workpieces and parts: cutting, milling, grinding, drilling, hardening. Metal-cutting tools for performing these operations. Devices for processing workpieces and parts. Compilation of technological processes for the manufacture of parts. Technological control of assembly drawings. Assembly of connections.

Purpose of studying of the discipline

Getting the students basic knowledge in the field of process assembly machines.

Learning Outcomes

ON3 To develop design, technical, design and technological documentation, to carry out its expertise and feasibility study of design solutions

Learning outcomes by discipline

1) Uses modern methods of metal processing when performing technological processes
2) Manages technological processes when working on machine tools
3) Uses the necessary equipment and tools in the organization of technological processes for the processing of parts

Prerequisites

Descriptive geometry and engineering graphics

Postrequisites

Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

Cost management

Discipline cycle	Basic disciplines
Course	2
Credits count	3
Knowledge control form	Examination

Short description of discipline

The purpose of the course "Cost Management" is to develop students` competencies in cost management, the ability to conduct analytical work in the field of cost management. This discipline is aimed at forming students with a set of necessary theoretical knowledge to understand the essence of costs and the basics of their management, as well as practical skills necessary for the purposes of strategic cost management. As a result of the training, the student will be able to analyze and evaluate cost effectiveness, determine cost reduction measures, and calculate the effect of cost reduction.

Purpose of studying of the discipline
To reveal the problems in the field of organization, planning and management of production in a market economy in order to reduce costs.
Learning Outcomes
ON8 Develop projects of workshops and sites of industrial enterprises
Learning outcomes by discipline
1) Demonstrates the ability to work effectively both individually and as a team member;
2) Draws up technical documentation (work schedules, instructions, plans, estimates, applications for materials, equipment, etc.), as well as established reporting on approved forms;
3) Organizes the work of small groups of performers.
Prerequisites
Bases of economics, law and ecological knowledge
Postrequisites
Design engineering of meat and dairy industry enterprises Design engineering of food industry enterprises

Physical methods of processing foods

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

Short description of discipline
In this course, electrophysical methods of processing raw materials are studied: food processing with infrared radiation, high-frequency food processing, electrocontact methods of food products, processing in an electrostatic field, electroflotation. Thermophysical processing methods. Acoustic methods of food processing: ultrasound treatment, pulse and pulsation processing methods. Changes in the physico-chemical properties and biological value after heat treatment of products are considered.
The student applies the acquired knowledge to carry out general engineering calculations of processes and working bodies and selects the appropriate equipment.
Purpose of studying of the discipline
Gaining knowledge about physical methods of food processing, an Engineering Physics - Mechanics (engineering rheology).
Learning Outcomes
ON5 To calculate hydraulic systems, water and heat supply systems
Learning outcomes by discipline
1) Uses basic and general knowledge in its subject area and applies their methods in various types of professional and social activities
2) Applies advanced physical processing methods in food production technology
3) Determines the characteristics of food products
Prerequisites
Physics
Postrequisites
Thermal and mass transfer processes and apparatus of food production Fundamentals of mathematical and computer modeling of technological processes Heat and Mass Transfer

Economics of enterprise

Discipline cycle	Basic disciplines
Course	2
Credits count	3
Knowledge control form	Examination

Short description of discipline
At the present stage of economic reforms, significant changes are taking place in the economy, especially at the microeconomic level: the nature and methods of economic activity of enterprises are changing. This course studies in detail the resources of the enterprise, the efficiency of their use, profitability and the main technical and economic indicators of the functioning of the enterprise. In addition, methods of stimulating labor resources, in order to optimize the production capacity and capital of the enterprise.
Purpose of studying of the discipline
The purpose of studying the discipline "Enterprise Economics" is to develop students` economic thinking based on the study of the economic mechanism of the enterprise in market conditions, providing deep theoretical knowledge and practical experience in the field of economics and organization of the enterprise and the use of technological equipment.
Learning Outcomes
ON8 Develop projects of workshops and sites of industrial enterprises
Learning outcomes by discipline
1) Demonstrates the ability to work effectively both individually and as a team member;
2) Assesses the feasibility study of design solutions;
3) Organizes activities related to the management of the actions of individual employees.
Prerequisites
Bases of economics, law and ecological knowledge
Postrequisites
Prediploma practice Manufacturing practice III

Installation and operation of technological machines

Discipline cycle	Profiling discipline
Course	2

Credits count	5
Knowledge control form	Examination

Short description of discipline
The course examines advanced methods of installation and operation of technological machines and equipment in order to ensure the rhythmic and economical operation of technological machines and equipment for food production. Purpose and types of bases and foundations for equipment. Methods of installing machines on the foundation. Assembly of connections and gears. Installation of pipelines. Installation of electrical wiring. Organization of operation of technological machines and equipment. The student, applying regulatory documents on the installation and operation of technological machines and equipment, will learn how to calculate foundations, the duration of installation of equipment, the number of teams required to carry out various installation works.

Purpose of studying of the discipline
Famiiarization of students with the installation and technical operation of technological machines to ensure high-quality operation and installation of equipment, reliable and productive work in various conditions.

Learning Outcomes
ON6 To carry out installation, operation and repair of technological machines and equipment

Learning outcomes by discipline
1) Regulatory documents on installation and operation of technological machines and equipment;
2) Organizes safe working conditions and elimination of accidents;
3) Applies advanced methods of installation and operation of technological machines and equipment, ensuring the rhythmic and economical operation of equipment.

Prerequisites
Introduction to Specialty

Postrequisites
Repair technological machines Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

Control Theory

Discipline cycle	Profiling discipline
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline
This course examines the basics of regulating production processes in the food industry. Classification of automatic control systems. Automation of control and regulation. Mathematical models of technological processes of food production. Stability of the automatic control system. Methods for assessing the quality of regulation of technological processes of food production. Technical means of the control system of technological processes. Technical means of collecting and registering indicators. Amplifier- converter devices. Executive devices.

Purpose of studying of the discipline
Training methods of analysis and synthesis of automatic control systems and industrial process control.

Learning Outcomes
ON6 To carry out installation, operation and repair of technological machines and equipment

Learning outcomes by discipline
1) Uses methods of stability and quality analysis of automatic control systems;
2) Applies control and measuring devices to measure technological parameters;
3) Performs automatic regulation and management of technical facilities.

Prerequisites
Interchangeability, standardization and technical measurements

Postrequisites
Repair technological machines Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

Electrical engineering

Discipline cycle	Profiling discipline
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline
This course contains information about electric energy and electric machines used in technological machines and equipment in food production. Studies direct and alternating electric current, electrical circuits, their resistance, capacitance and inductance. Serial and parallel connection of elements. Three-phase electrical circuits. The connection is a star and a triangle. The power of the three-phase circuit. Transformers. Electric motors. Selection of electric motors and wires.

Purpose of studying of the discipline
Theoretical and practical training of engineers is not in electrical engineering specialties in the field of electrical engineering.

Learning Outcomes
ON6 To carry out installation, operation and repair of technological machines and equipment

Learning outcomes by discipline
1) Assesses the phenomena occurring in electrical circuits and the properties of electrical machines and transformers
2) Selects transformers, electric motors and wires;
3) Applies transformers, DC and AC electrical machines and uses control and protection equipment for electrical circuits.

Prerequisites
Interchangeability, standardization and technical measurements
Postrequisites
Repair technological machines Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

Fundamentals of mathematical and computer modeling of technological processes

Discipline cycle	Basic disciplines
Course	2
Credits count	5
Knowledge control form	Examination and term work/Project

Short description of discipline
In this course, students will gain knowledge about the basics of mathematical and computer modeling of technological processes. They will study the classification of models, the principles of creating mathematical models of food processes and the general principles of computer modeling. They will get acquainted with the technology of building models and methods of simulating random patterns, data interpretation, analysis and processing of modeling results. They will study methods of modeling continuous systems and modeling of production processes.
Purpose of studying of the discipline
Getting organized knowledge in the field of principles of construction and use of mathematical models of manufacturing processes and design methods of modeling algorithms to implement mathematical models
Learning Outcomes
ON5 To calculate hydraulic systems, water and heat supply systems
Learning outcomes by discipline
1) Uses basic and general knowledge in its subject area and applies their methods in various types of professional and social activities
2) Models production processes and control systems
3) Designs mathematical models of production processes
Prerequisites
Mechanical and hydro-mechanical processes and apparatus of food production
Postrequisites
Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

Hydropneumatic machines and drives

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

Short description of discipline
In this course, students study the structural and functional features of hydraulic drives, their application in technological machines and production systems; classification, device, operating principle and methods of regulating hydraulic drives; standard methods of calculating hydraulic drive for equipment of food, meat and dairy industries; pumps necessary to ensure the operability of the hydraulic system; auxiliary devices of hydraulic drives; devices of systems hydro- and pneumatic automatics.
Purpose of studying of the discipline
Getting the students` knowledge in the field of hydraulic pneumatic machineryand hydraulic pneumatic actuators of technological machines.
Learning Outcomes
ON6 To carry out installation, operation and repair of technological machines and equipment
Learning outcomes by discipline
1) Makes hydraulic schemes of hydraulic transmission and hydraulic pneumatic drive
2) Applies standard methods for calculating hydraulic drive for equipment of food, meat and dairy industry enterprises
3) Selects the pumps necessary to ensure the operability of the hydraulic system
Prerequisites
Hydraulics Fluid and gas mechanics Fluid dynamics and heat and mass transfer
Postrequisites
Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

Intellectual property in quality management

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

Short description of discipline
In this course, the student studies the content of the Patent Law of the Republic of Kazakhstan, the law on the protection of intellectual property and copyrights; the volume and composition of intangible assets of enterprises, their condition and development; innovative activities of enterprises; ways to improve the qualification level of personnel; forms of accounting for innovation proposals and inventions during production; registration of application materials for intellectual property objects. As a result of the training, the student will be able to organize the innovative activities of the enterprise, draw up application materials for intellectual property objects.

Purpose of studying of the discipline
Expand the contents of the Patent Law of the Republic of Kazakhstan.
Learning Outcomes
ON7 To perform calculation, design and modernization of technological equipment of enterprises
Learning outcomes by discipline
1) Uses modern educational and information technologies to acquire new knowledge
2) Organizes the innovative activity of the enterprise
3) Draws up application materials for intellectual property objects
Prerequisites
Descriptive geometry and engineering graphics
Postrequisites
Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

The methods of experimental data processing

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

Short description of discipline
The course studies methods of processing experimental data obtained during the study of technological processes of the food industry; methods of mathematical processing of experimental results; characteristics of a random variable; distribution functions and their properties of errors of direct and indirect measurements; processing of experimental results using computer technology; plotting the results of experiments; identification algorithms, their capabilities and applications.
Purpose of studying of the discipline
To prepare the student for independent research
Learning Outcomes
ON2 Apply the basic laws of natural science disciplines for mastering technological processes in food production
Learning outcomes by discipline
1) Makes rational mathematical descriptions of technological processes
2) Analyzes techniques, methods, methods of formalization of objects, processes, phenomena
3) Creates mathematical models of technological processes
Prerequisites
Hydraulics Fluid and gas mechanics Fluid dynamics and heat and mass transfer
Postrequisites
Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

Bases of water supply, sewerage and thermal networks

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

Short description of discipline
This course studies the rules and technologies of installation, commissioning, testing during operation of cold and hot water supply systems, sewerage and heating networks of food production enterprises. Various systems of water supply of workshops are considered. Pipelines, shut-off and control valves, safety valves. Fire water supply. Industrial and household sewerage. Heat supply of industrial premises. Fundamentals of calculation of hydraulic systems of water and heat supply, sewerage systems of food production enterprises. As a result of the training, the student is able to perform engineering calculations of pipelines and devices for water supply systems, sewerage and heating networks, apply rules and technologies for installation, commissioning, testing during operation of water supply systems, sewerage and heating networks.
Purpose of studying of the discipline
Getting the students knowledge of the structure calculations and the design basis water supply systems, sewerage systems, heating networks.
Learning Outcomes
ON5 To calculate hydraulic systems, water and heat supply systems
Learning outcomes by discipline
1) Uses basic and general knowledge in its subject area and applies their methods in various types of professional and social activities
2) Performs engineering calculations of pipelines and devices for water supply systems, sewerage and heating networks
3) Uses the rules and technologies of installation, commissioning, testing during operation of water supply systems, sewerage and heating networks
Prerequisites
Hydraulics Fluid and gas mechanics Fluid dynamics and heat and mass transfer
Postrequisites
Design engineering of meat and dairy industry enterprises Design engineering of food industry enterprises

Fundamentals of innovation and patenting

Discipline cycle	Basic disciplines
Course	2

Credits count	5
Knowledge control form	Examination

Short description of discipline
The course examines the innovation process and types of research work, methods of legal regulation of innovation, basic terms and concepts of intellectual property, state bodies for the protection of intellectual property rights, systems of international classification of goods and services. The student will learn how to identify inventions in the scientific and technical documentation being developed, draw up applications for industrial property objects, claims and determine the scope of patent rights.

Purpose of studying of the discipline
The study of scientific and theoretical and methodological foundations of patents and innovation, the State regulatory system in the field of intellectual property, the organization of systems of examination and preparation of application materials filed with the patenting of industrial property in the Republic of Kazakhstan.

Learning Outcomes
ON4 Apply standard methods of designing mechanical systems taking into account their operating conditions

Learning outcomes by discipline
1) Uses modern educational and information technologies to acquire new knowledge
2) Conducts an examination and draws up application materials submitted for patenting industrial property objects
3) Uses methods of separation and consolidation of patent law

Prerequisites
Descriptive geometry and engineering graphics

Postrequisites
Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

Fundamentals of scientific research

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

Short description of discipline
This course examines the scientific foundations of technological processes and machines of the food industry, discusses topical issues of the development of branch science, the advantages and disadvantages of the existing hardware design of food industry enterprises and possible ways to improve it, examines the main stages and methods of conducting research, rules for the design and publication of student research papers and their protection.

Purpose of studying of the discipline
Learning the basics, types, methods and techniques of research

Learning Outcomes
ON6 To carry out installation, operation and repair of technological machines and equipment

Learning outcomes by discipline
1) Selects the relevant scientific direction and topic of scientific research
2) Processes the results of experiments
3) Draws up a report on research work

Prerequisites
Hydraulics Fluid and gas mechanics Fluid dynamics and heat and mass transfer

Postrequisites
Design of technological machines and equipment Design of equipment for small food production enterprises Design of machines for mechanical processing of food raw materials

Patenting

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

Short description of discipline
This course examines the legislation of the Republic of Kazakhstan and foreign countries in the field of intellectual property protection; types of patent documentation; description of inventions; codes for identifying bibliographic data in the description of the invention, methods of searching and primary processing of scientific and technical information; features of the text; composition of the application for industrial property; registration of application materials for inventions and utility models.

Purpose of studying of the discipline
The purpose of studying the discipline "Patenting" is to acquire knowledge in the field of protection of intellectual property objects and the rules for registration of patent documentation.

Learning Outcomes
ON4 Apply standard methods of designing mechanical systems taking into account their operating conditions

Learning outcomes by discipline
1) Does the search and primary processing of scientific and scientific-technical information
2) Performs patent research in order to ensure the patent purity of new design solutions and their patentability
3) Uses modern educational and information technologies to acquire new knowledge

Prerequisites
Descriptive geometry and engineering graphics

Postrequisites

Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

Thermal and mass transfer processes and apparatus of food production

Discipline cycle	Basic disciplines
Course	2
Credits count	5
Knowledge control form	Examination and term work/Project

Short description of discipline
In this course, students will gain knowledge about thermal and mass transfer processes and devices of food production. They will study the mechanisms of heat exchange and mass transfer processes; methods of heat transfer; thermal and material balances; basic equations of heat transfer and mass transfer; information on ways to intensify heat and mass transfer processes. Students will acquire the skills of calculation and design of thermal and mass transfer processes and devices.

Purpose of studying of the discipline
Preparation of basic knowledge in the field of heat and mass transfer processes and apparatus engineering calculations.

Learning Outcomes
ON5 To calculate hydraulic systems, water and heat supply systems

Learning outcomes by discipline
1) Uses basic and general knowledge in its subject area and applies their methods in various types of professional and social activities
2) Classifies equipment for carrying out basic technological processes and performs calculations of thermal and mass transfer processes and apparatuses
3) Explains the technological processes of material processing with the indication of technological parameters for obtaining finished products

Prerequisites
Basics of Heat Engineering Mechanical and hydro-mechanical processes and apparatus of food production

Postrequisites
Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

Physico-chemical methods of water preparation

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

Short description of discipline
This course examines the issues of physico-chemical preparation of water for its subsequent use in technological processes of food production at enterprises. The properties of water and the requirements for its quality are studied; methods of water purification; technological schemes for clarification, discoloration, disinfection, desalination, degreasing, stabilization. Students calculate the performance of water treatment equipment: mixers, flocculation chambers, settling tanks, clarifiers, filters

Purpose of studying of the discipline
Study of methods of water treatment and the organization of water chemistry.

Learning Outcomes
ON5 To calculate hydraulic systems, water and heat supply systems

Learning outcomes by discipline
1) Uses basic and general knowledge in its subject area and applies their methods in various types of professional and social activities
2) Determines the characteristics of impurities and the main indicators of water quality
3) Designs water treatment systems taking into account the initial data and the requirements

Prerequisites
Hydraulics Fluid and gas mechanics Fluid dynamics and heat and mass transfer

Postrequisites
Design engineering of meat and dairy industry enterprises Design engineering of food industry enterprises

Power systems life support

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

Short description of discipline
This course examines the life support systems of food production enterprises, which include energy supply systems, water supply systems, heat supply systems, ventilation systems. The issues of creating comfortable conditions for staff in production facilities are being considered. The device and principle of operation are studied, calculations of electric power plants, cold and hot water supply systems, heat supply equipment, ventilation and indoor air conditioning equipment are performed.

Purpose of studying of the discipline
Formation of knowledge on the fundamentals of the theory and practice of human life support systems engineering, introduction to scientific principles, technical means in practical ways of creating and maintaining normal atmospheric conditions and requirements of the purity of the air in the workplace and in the area of human habitation in the conditions of production.

Learning Outcomes
ON5 To calculate hydraulic systems, water and heat supply systems

Learning outcomes by discipline

1) Uses basic and general knowledge in its subject area and applies their methods in various types of professional and social activities
2) Solves the problems of heat supply and industrial ventilation
3) Assesses the state of engineering systems of industrial enterprises

Prerequisites

Hydraulics Fluid and gas mechanics Fluid dynamics and heat and mass transfer

Postrequisites

Design engineering of meat and dairy industry enterprises Design engineering of food industry enterprises

Repair technological machines

Discipline cycle	Profiling discipline
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline

This course comprehensively addresses the issues of repair of technological machines and equipment. Causes of wear and methods of restoration of technological machines and equipment. Types of repairs: inspection, maintenance, routine repairs, medium repairs, major repairs. The system of scheduled preventive maintenance of technological equipment. Repair standards. Planning of repair work. Organization and carrying out repairs. Technology of repair and restoration of typical parts of technological machines.

Purpose of studying of the discipline

Purpose of studying of the discipline "Repair of technological machines" - familiarization of students with the system and methods of solving production problems in the repair of technological machines and equipment; system study of repair processes of technological machines and equipment, providing their design life with the new achievements in mechanical engineering.

Learning Outcomes

ON6 To carry out installation, operation and repair of technological machines and equipment

Learning outcomes by discipline

1) Classifies types of repairs, plans and accounts for repairs, develops schedules for the organization of repair of mechanical equipment;
2) Uses structural materials used for maintenance and routine repair of technological machines and equipment;
3) Organizes preventive inspections, repairs, acceptance and development of the equipment being introduced, prepares technical documentation and instructions for the operation and repair of equipment.

Prerequisites

Technology of construction materials

Postrequisites

Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

Automation and automated control systems

Discipline cycle	Profiling discipline
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline

In this course, the main aspects of automation and automated control systems for technological processes of food production are studied; modern control and measuring devices and their technical characteristics are considered; control and measuring devices for measuring technological parameters: temperature, pressure, humidity, level, flow, concentration; regulating devices; automatic control systems for technological processes of dairy production products, semi-finished meat products, sausage products, pasta production.

Purpose of studying of the discipline

Study of various methods and types of measurements, identification of errors and accuracy classes, use of measuring instruments, the choice of means of automation of technological processes.

Learning Outcomes

ON6 To carry out installation, operation and repair of technological machines and equipment

Learning outcomes by discipline

1) Assesses the reliability and cost-effectiveness of measuring systems;
2) Sets up measuring instruments and primary transducers for research and operation in industrial conditions;
3) Measures the parameters of technological processes.

Prerequisites

Control Theory Electrical engineering

Postrequisites

Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

Basics of artistic design

Discipline cycle	Profiling discipline
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline

This course examines the significance of the goals and objectives of artistic design, the history of development and stages of artistic design, design features of technological machines and equipment of the food industry, the requirements for materials and construction of technological machines and equipment of the food industry, the main methods of design and technological solutions for the layout of

technological equipment, the principles of ergonomic design of technological machines and equipment of food production.

Purpose of studying of the discipline

Getting basic knowledge in the field of artistic design equipment needed for further study of special subjects and practical activities in the specialty.

Learning Outcomes

ON6 To carry out installation, operation and repair of technological machines and equipment

Learning outcomes by discipline

1) Uses the principles of ergonomic design of technological machines and equipment of food production;
2) Applies the main methods of design and technological solutions for the layout of technological equipment;
3) Builds models of real equipment.

Prerequisites

Technology of construction materials

Postrequisites

Design of technological machines and equipment Design of equipment for small food production enterprises Design of machines for mechanical processing of food raw materials

Equipment for heating and cooling processing of meat and dairy products

Discipline cycle	Profiling discipline
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline

This course examines information about heat exchangers used in the meat and dairy industries. The device, principle of operation and features of operation of technological equipment with electric, gas, steam and fire heating are considered. The advantages and disadvantages of various methods of heat treatment are described. The device, the principle of operation and the basic calculations of the areas of refrigerators and warehouses for meat and dairy products are considered. The student will be able to make calculations of devices for thermal and refrigerating processing of meat and dairy products.

Purpose of studying of the discipline

The study design and calculation of heating devices, devices, planning, calculation and main industrial refrigerators refrigeration equipment.

Learning Outcomes

ON7 To perform calculation, design and modernization of technological equipment of enterprises
ON9 Apply engineering knowledge to develop and implement projects that meet the specified requirements

Learning outcomes by discipline

1) Organizes maintenance of technological equipment of meat and dairy industries, electric, hydro and pneumatic drives for the implementation of production processes;
2) Analyzes ways to improve and modernize the technological equipment of meat and dairy industries with the possibility of replacing it to ensure energy and resource conservation due to internal reserves and increase the energy efficiency of both individual installations and technological schemes;
3) Designs new technological schemes, selects technological parameters, calculates and selects equipment for meat and dairy production.

Prerequisites

Basics of Heat Engineering

Postrequisites

Engineering of dairy industry enterprises Engineering of meat industry enterprises

Equipment for heating and cooling processing of food products

Discipline cycle	Profiling discipline
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline

The discipline contains information on the engineering support of heat exchange processes at enterprises of grain processing, bakery, fat and oil, confectionery and other branches of the food industry and catering enterprises. The device, the principle of operation and the technique of engineering calculation of technological equipment for the implementation of thermal processes are studied. The issues of storage of food raw materials and finished products are considered, the device and features of work of warehouses and refrigerating chambers for food products are studied.

Purpose of studying of the discipline

The study design and calculation of heating devices, devices, planning, calculation and main industrial refrigerators refrigeration equipment.

Learning Outcomes

ON7 To perform calculation, design and modernization of technological equipment of enterprises
ON9 Apply engineering knowledge to develop and implement projects that meet the specified requirements

Learning outcomes by discipline

1) Organizes maintenance of technological equipment of food production, electric, hydro and pneumatic drives for the implementation of production processes;
2) Analyzes ways to improve and modernize technological equipment for food production with the possibility of replacing it to ensure energy and resource conservation due to internal reserves and increase energy efficiency of both individual installations and technological schemes;
3) Designs new technological schemes, selects technological parameters, calculates and selects food production equipment.

Prerequisites
Basics of Heat Engineering
Postrequisites
Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of public catering enterprises

Heat and Mass Transfer

Discipline cycle	Profiling discipline
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline
In this course, methods of heat transfer are studied: thermal conductivity, convection and thermal radiation. Heat transfer and heat transfer. The basic equation of heat transfer. Heat transfer coefficient. Heat transfer coefficients. Thermal resistance. Thermal conductivity of a flat wall and cylindrical wall, spherical wall. Heating or cooling of the body in an environment with a constant temperature. Heating or cooling of the body in an environment with a harmonically varying temperature. Thermal inertia of the body. As a result of the training, the student applies the basic laws of heat and mass transfer to solve professional problems, uses methods of experimental determination of thermophysical characteristics.
Purpose of studying of the discipline
Obtain extensive knowledge of the fundamental laws, laws and methods of analysis and calculation of heat and mass transfer processes, running away skills characterization of heat and mass transfer processes of thermal power equipment and apparatus.
Learning Outcomes
ON5 To calculate hydraulic systems, water and heat supply systems
Learning outcomes by discipline
1) Uses basic and general knowledge in its subject area and applies their methods in various types of professional and social activities
2) Applies the basic laws of heat and mass transfer to solve professional problems
3) Uses methods of experimental determination of thermophysical characteristics
Prerequisites
Mechanical and hydro-mechanical processes and apparatus of food production
Postrequisites
Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

Engineering of oil and fat industry enterprises

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

Short description of discipline
In this course, students will receive information about the main machines and apparatus for the production of vegetable oils used in enterprises of various scales. Students will master the basics of design development, maintenance and operation of equipment for the raw materials department and in-plant transport, equipment for preparing seeds for oil production, equipment for oil production by pressing, equipment for oil extraction.
Purpose of studying of the discipline
Training and preparation of students for production activities related to the creation of machines and apparatus for the production of vegetable oils, as well as solving engineering problems for the installation, commissioning and maintenance of equipment.
Learning Outcomes
ON7 To perform calculation, design and modernization of technological equipment of enterprises
ON9 Apply engineering knowledge to develop and implement projects that meet the specified requirements
Learning outcomes by discipline
1) Classifies the main types of technological equipment
2) Owns the methods of engineering calculation of technological equipment
3) Organizes the commissioning and operation of technological equipment for the production of vegetable oils
Prerequisites
Repair technological machines
Postrequisites
Prediploma practice Manufacturing practice III

Machines, automats and flow lines of the meat and dairy industries

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

Short description of discipline
In this course, technological production lines used at meat and dairy industry enterprises are studied. Structure, classification and main types of automatic feeders by piece products. Functional elements of feeders. Off-site orientation. Devices for automatic orientation of products in space. Devices for automatic dosing, gripping and clamping, packaging, stacking, locking. Closed, open and combined production lines. As a result of the training, the student will gain skills in calculating and designing production lines of meat and dairy production, is able to organize maintenance and management of production lines of the meat and dairy industry.

Purpose of studying of the discipline
Getting basic knowledge in oblasti machines, machines and production lines.
Learning Outcomes
ON7 To perform calculation, design and modernization of technological equipment of enterprises
Learning outcomes by discipline
1) Explains the main directions and prospects for the development of complex mechanization and automation of meat and dairy production, the requirements for technological lines;
2) Organizes maintenance and management of automated production lines of the meat and dairy industry;
3) Offers technical solutions for the modification of technological equipment of the meat and dairy industry.
Prerequisites
Theory of mechanisms and machines Strength of materials Bases of calculation elements of machine
Postrequisites
Prediploma practice Manufacturing practice III

Machines, automats and flow lines of the food industries

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

Short description of discipline
In this course, technological production lines and automatic machines used in food industry enterprises are studied. Modern forms of organization of technological complexes, machine and hardware schemes of technological lines for processing raw materials of plant and animal origin are considered. The characteristics of products, raw materials and semi-finished products, features of production and consumption of finished products, stages of the technological process, characteristics of equipment complexes, device and principles of operation of the line are studied. As a result of the training, the student explains the main directions and prospects for the development of integrated mechanization and automation of food production, the requirements for technological lines, organizes maintenance and management of automated production lines of the food industry, offers technical solutions for the modernization of technological equipment of the food industry.
Purpose of studying of the discipline
Getting basic knowledge in oblasti machines, machines and production lines.
Learning Outcomes
ON7 To perform calculation, design and modernization of technological equipment of enterprises
Learning outcomes by discipline
1) Explains the main directions and prospects for the development of complex mechanization and automation of food production, the requirements for technological lines;
2) Organizes maintenance and management of automated production lines of the food industry;
3) Offers technical solutions for the modification of technological equipment of the food industry.
Prerequisites
Theory of mechanisms and machines Strength of materials Bases of calculation elements of machine
Postrequisites
Prediploma practice Manufacturing practice III

Engineering of ventilation systems of meat and dairy industry enterprises

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

Short description of discipline
In this course, the ventilation system of industrial buildings of meat and dairy industry enterprises is studied: types of air pollution in production and methods of cleaning gases released during the operation of technological equipment; air purification in industrial premises; installation of ventilation systems in industrial premises; calculation of the volume of air in the room and the frequency of its renewal; methods for calculating ventilation systems; selection of fans.
Purpose of studying of the discipline
Study of the properties of dusty, polluted air, methods of its purification, designs of ventilation installations and other dust separators used at meat and dairy industry enterprises.
Learning Outcomes
ON8 Develop projects of workshops and sites of industrial enterprises
Learning outcomes by discipline
1) Shows the ability to work effectively both individually and as a team member;
2) Analyzes the technical condition of industrial ventilation of meat and dairy industry enterprises;
3) Selects the equipment of ventilation systems of meat and dairy industry enterprises.
Prerequisites
Hydraulics Fluid and gas mechanics Fluid dynamics and heat and mass transfer
Postrequisites
Prediploma practice Manufacturing practice III

Engineering of ventilation systems of food industry enterprises

Discipline cycle	Profiling discipline
Course	3

Credits count	5
Knowledge control form	Examination

Short description of discipline
This course examines the basic physical properties of humid air, air conditioning issues, ventilation systems for food enterprises, air requirements in industrial premises, determination of the amount of harmful emissions, fire and explosion hazard of food production, requirements for ventilation and air conditioning systems for food production, equipment for ventilation and air conditioning systems for grain processing, bakery, fat-and-oil, sugar enterprises, enterprises of the confectionery industry.

Purpose of studying of the discipline
Study of the properties of dusty, polluted air, methods of its purification, designs of ventilation systems and other dust separators used in food industry enterprises.

Learning Outcomes
ON8 Develop projects of workshops and sites of industrial enterprises

Learning outcomes by discipline
1) Shows the ability to work effectively both individually and as a team member;
2) Analyzes the technical condition of industrial ventilation of food industry enterprises;
3) Selects the equipment of ventilation systems of food industry enterprises.

Prerequisites
Hydraulics Fluid and gas mechanics Fluid dynamics and heat and mass transfer

Postrequisites
Prediploma practice Manufacturing practice III

Engineering of confectionery industry enterprises

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

Short description of discipline
This course examines the technological equipment for the production of flour confectionery products: equipment for performing warehouse and preparatory operations, kneading machines, dough dividing machines, forming machines, equipment for finishing products, confectionery ovens of various types, as well as packaging equipment used in confectionery factories. Students will be able to perform general engineering calculations of machines and apparatuses of confectionery production.

Purpose of studying of the discipline
Study of the device and the principle of operation of engineering equipment used in the production of flour confectionery products

Learning Outcomes
ON7 To perform calculation, design and modernization of technological equipment of enterprises
ON9 Apply engineering knowledge to develop and implement projects that meet the specified requirements

Learning outcomes by discipline
1) Identifies and classifies the technological equipment of enterprises producing flour confectionery products
2) Uses the basic methods of engineering calculation of technological equipment
3) Carries out measures to modernize technological equipment

Prerequisites
Thermal and mass transfer processes and apparatus of food production Fundamentals of mathematical and computer modeling of technological processes Heat and Mass Transfer

Postrequisites
Prediploma practice Manufacturing practice III

Engineering of dairy industry enterprises

Discipline cycle	Profiling discipline
Course	3
Credits count	6
Knowledge control form	Examination

Short description of discipline
In this course, technological equipment of dairy industry enterprises is studied. Tanks. Pumps. Homogenizers. Separators with the basics of the theory of centrifugal separation. Heat exchangers: tubular, plate, jacket. Equipment for the production of butter, ice cream, cheese, cottage cheese, cream, dairy products, milk powder and cream. Technological equipment for washing containers, packaging, filling dairy products. Technological calculations. Thermal calculations. Hydraulic calculations.

Purpose of studying of the discipline
The purpose of studying the discipline "Engineering of dairy industry enterprises" is to prepare students for production and technical, design and research activities related to the operation of technological equipment of the dairy industry.

Learning Outcomes
ON7 To perform calculation, design and modernization of technological equipment of enterprises
ON9 Apply engineering knowledge to develop and implement projects that meet the specified requirements

Learning outcomes by discipline
1) Organizes maintenance of technological equipment of dairy production, electric, hydro and pneumatic drives for the implementation of production processes;
2) Analyzes ways to improve and modernize the technological equipment of dairy production with the possibility of replacing it to ensure energy and resource conservation due to internal reserves and increase the energy efficiency of both individual installations and technological schemes;
3) Designs new technological schemes, selects technological parameters, calculates and selects equipment for dairy production.

Prerequisites
Repair technological machines
Postrequisites
Prediploma practice Manufacturing practice III

Engineering of meat industry enterprises

Discipline cycle	Profiling discipline
Course	3
Credits count	6
Knowledge control form	Examination

Short description of discipline
This course examines the technological equipment of meat industry enterprises. Working bodies of technological equipment. Suspension tracks. Skin photography. Machines with cutting working bodies, flexible and roller working bodies. Equipment based on: drum, irrigation, spraying working bodies; screw, screw and blade working bodies. Equipment for separating products in the field of gravity. Equipment for pressing.The student will learn how to make technological and engineering calculations of equipment.
Purpose of studying of the discipline
Expand the knowledge base in the field of process equipment and machinery.
Learning Outcomes
ON7 To perform calculation, design and modernization of technological equipment of enterprises
ON9 Apply engineering knowledge to develop and implement projects that meet the specified requirements
Learning outcomes by discipline
1) Organizes maintenance of technological equipment of meat production, electric, hydro and pneumatic drives for the implementation of production processes;
2) Analyzes ways to improve and modernize the technological equipment of meat production with the possibility of replacing it to ensure energy and resource conservation due to internal reserves and increase the energy efficiency of both individual installations and technological schemes;
3) Designs new technological schemes, selects technological parameters, calculates and selects equipment for meat production.
Prerequisites
Repair technological machines Installation and operation of technological machines
Postrequisites
Prediploma practice Manufacturing practice III

Engineering of public catering enterprises

Discipline cycle	Profiling discipline
Course	3
Credits count	6
Knowledge control form	Examination

Short description of discipline
The course contains information about the technological equipment of public catering enterprises. Technological equipment for washing raw materials of vegetable and animal origin. Technological equipment for cutting, crushing, grinding, pressing, filtering. Agitators, kneading- stirring and whipping machines. Equipment for separation of heterogeneous piece, bulk and liquid components, dosing and molding machines. Heating devices of public catering: cookers, frying cabinets, stoves, boilers, stoves. The student will learn how to make technological and engineering calculations of catering equipment.
Purpose of studying of the discipline
The purpose of studying the discipline is to prepare students for industrial, technical, design and research activities related to the operation of technological equipment of public catering enterprises.
Learning Outcomes
ON7 To perform calculation, design and modernization of technological equipment of enterprises
ON9 Apply engineering knowledge to develop and implement projects that meet the specified requirements
Learning outcomes by discipline
1) Organizes maintenance of technological equipment of public catering enterprises, electric, hydro and pneumatic drives for the implementation of production processes;
2) Analyzes ways to improve and modernize the technological equipment of public catering enterprises with the possibility of replacing it to ensure energy and resource conservation due to internal reserves and increase the energy efficiency of both individual installations and technological schemes;
3) Designs new technological schemes, selects technological parameters, calculates and selects equipment for public catering enterprises.
Prerequisites
Thermal and mass transfer processes and apparatus of food production Fundamentals of mathematical and computer modeling of technological processes The quality management system
Postrequisites
Prediploma practice Manufacturing practice III

Engineering of food industry enterprises

Discipline cycle	Profiling discipline
Course	3
Credits count	6
Knowledge control form	Examination

Short description of discipline

This course contains information about the technological equipment of food production enterprises. Basic calculations of equipment performance and capacity. Technological equipment for the implementation of mechanical processes: grinding, cutting, sorting, pressing. Technological implementation equipment for hydromechanical processes: separation, filtration, mixing, transportation of liquids. Ways of technical improvement and modernization of technological machines and equipment in order to introduce energy- and resource-saving technologies.

Purpose of studying of the discipline

Expand the knowledge base in the field of technological equipment and machinery

Learning Outcomes

ON7 To perform calculation, design and modernization of technological equipment of enterprises
ON9 Apply engineering knowledge to develop and implement projects that meet the specified requirements

Learning outcomes by discipline

1) Organizes maintenance of technological equipment of food production, electric, hydro and pneumatic drives for the implementation of production processes;
2) Analyzes ways to improve and modernize technological equipment for food production with the possibility of replacing it to ensure energy and resource conservation due to internal reserves and increase energy efficiency of both individual installations and technological schemes;
3) Designs new technological schemes, selects technological parameters, calculates and selects food production equipment.

Prerequisites

Repair technological machines

Postrequisites

Prediploma practice Manufacturing practice III

Design of machines for mechanical processing of food raw materials

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

Short description of discipline

This course examines the basic designs of mechanical equipment, progressive methods of operation of equipment for the mechanical processing of food products, the main components of equipment, materials used for the manufacture of various structural elements. The student performs kinematic, strength and strength calculations, offers new technical solutions, ways to improve mechanical equipment. Performs the design of a machine for the mechanical processing of food raw materials. Draws up design text and graphic documentation.

Purpose of studying of the discipline

Get competencies needed for the design work to complete drawing documentation in creating machines for mechanical processing of food raw materials.

Learning Outcomes

ON7 To perform calculation, design and modernization of technological equipment of enterprises
ON9 Apply engineering knowledge to develop and implement projects that meet the specified requirements

Learning outcomes by discipline

1) Designs technological machines and equipment for mechanical processing of food raw materials;
2) Develops design and working documentation of machines for mechanical processing of food raw materials;
3) Draws up completed design work for the design of machines for the mechanical processing of food raw materials.

Prerequisites

Repair technological machines

Postrequisites

Prediploma practice Manufacturing practice III

Design of equipment for small food production enterprises

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

Short description of discipline

The student studies the design features of modern machines and apparatuses for small food production enterprises and progressive methods of its operation; materials recommended for use in the design of equipment of small and medium capacity; reliability and design issues; ways to improve technology, upgrade existing equipment, in order to improve technical and economic indicators. Performs engineering calculations, confirms the correctness of the chosen solution, offers new technical solutions.

Purpose of studying of the discipline

Get the competencies necessary for the design of equipment for small food production enterprises.

Learning Outcomes

ON7 To perform calculation, design and modernization of technological equipment of enterprises
ON9 Apply engineering knowledge to develop and implement projects that meet the specified requirements

Learning outcomes by discipline

1) Designs technological machines and equipment for small food production enterprises;
2) Develops design and working documentation of equipment for small food production enterprises;
3) Draws up completed design work for the design of equipment for small food production enterprises.

Prerequisites

Repair technological machines

Postrequisites

Prediploma practice Manufacturing practice III

Design of technological machines and equipment

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

Short description of discipline
In this course, the issues of designing technological machines and equipment necessary for carrying out design work with full drawing documentation are studied. Calculation and design of working bodies of technological machines and equipment. Materials used for the manufacture of various structural elements. Kinematic, strength and strength calculations. Design of technological machines and equipment using ISO standards. Drawing and text-graphic documentation.

Purpose of studying of the discipline
Get the competencies necessary for carrying out design work with complete drawing documentation when creating technological machines and equipment for processing food raw materials.

Learning Outcomes
ON7 To perform calculation, design and modernization of technological equipment of enterprises
ON9 Apply engineering knowledge to develop and implement projects that meet the specified requirements

Learning outcomes by discipline
1) Designs technological machines and equipment;
2) Develops design and working documentation of technological machines and equipment;
3) Draws up the completed design work of technological machines and equipment.

Prerequisites
Repair technological machines

Postrequisites
Prediploma practice Manufacturing practice III

Design engineering of meat and dairy industry enterprises

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

Short description of discipline
In this course, comprehensive aspects of the design of meat and dairy industry enterprises are considered: the structure of meat and dairy industry enterprises; sanitary and technical requirements for production buildings; feasibility study of the project; design and estimate documentation; drawing up a plan of the site, workshop and enterprise as a whole; calculation of raw materials and product range; calculation of the areas of production workshops; arrangement of technological equipment; schedule of organization of technological processes.

Purpose of studying of the discipline
The purpose of studying the discipline "Design engineering of meat and dairy industry enterprises" is to form students knowledge and practical skills in designing workshops and sections of industrial enterprises of the meat and dairy industry.

Learning Outcomes
ON8 Develop projects of workshops and sites of industrial enterprises

Learning outcomes by discipline
1) Shows the ability to work effectively both individually and as a team member
2) Formulates the basic requirements for the design of meat and dairy industry enterprises
3) Develops working design and technical documentation, draws up completed design work in accordance with the requirements of regulatory documents

Prerequisites
Repair technological machines

Postrequisites
Prediploma practice Manufacturing practice III

Design engineering of food industry enterprises

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

Short description of discipline
In this course, comprehensive aspects of the design of food industry enterprises are considered: the structure of food industry enterprises; sanitary and technical requirements for production buildings; feasibility study of the project; design and estimate documentation; drawing up a plan of the site, workshop and enterprise as a whole; engineering communications design; calculation of raw materials and product range; calculation of the areas of production workshops; arrangement of technological equipment; schedule of organization of technological processes.

Purpose of studying of the discipline
The purpose of studying the discipline "Design engineering of food industry enterprises" is the formation of students knowledge and practical skills in designing workshops and sections of industrial food industry enterprises.

Learning Outcomes
ON8 Develop projects of workshops and sites of industrial enterprises

Learning outcomes by discipline
1) Demonstrates the ability to work effectively both individually and as a team member
2) Formulates the basic requirements for the design of food industry enterprises
3) Develops working design and technical documentation, draws up completed design work in accordance with the requirements of regulatory documents
Prerequisites
Repair technological machines
Postrequisites
Prediploma practice Manufacturing practice III

Calculation and design of technological equipment of the meat and dairy production

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

Short description of discipline
In this course, calculations and the basics of designing technological machines and equipment for meat and dairy industries are studied. The main provisions of the theory of plates and shells are studied; moment and momentless theory; calculation and design of devices operating under internal and external pressure; calculation of flange connections, supports of the device, bolted connections; rotary machines; features of their designs; calculation of the separator drum.
Purpose of studying of the discipline
The purpose of mastering the discipline "Calculation and design of technological equipment of the meat and dairy production" is to prepare students for organizational and technical, experimental research and design professional activities related to the calculation and design of modern, reliable technological machines and equipment for meat and dairy production.
Learning Outcomes
ON7 To perform calculation, design and modernization of technological equipment of enterprises
Learning outcomes by discipline
1) Performs calculations of technological equipment of meat and dairy industries for strength, rigidity, stability, endurance and fluctuations;
2) Analyzes the stress-strain state of the main components and parts of technological equipment of meat and dairy industries;
3) Calculates and designs parts and components of technological equipment of meat and dairy industries in accordance with the terms of reference using standard design automation tools.
Prerequisites
Basics of construction and machine parts Reliability of technological machines
Postrequisites
Prediploma practice Manufacturing practice III

Calculation and design of technological equipment of the food production

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

Short description of discipline
This course examines the main problems of scientific and technical development of food industry technology, studies the theoretical foundations and calculation methods of the most common machines and devices in the food industry for strength, rigidity and stability. Students acquire skills in calculating and designing technological equipment, get acquainted with the methodology for compiling the necessary technical documentation, find ways to modernize equipment in order to improve the quality of products.
Purpose of studying of the discipline
The purpose of mastering the discipline "Calculation and design of technological equipment of the food production " is to prepare students for organizational and technical, experimental research and design professional activities related to the calculation and design of modern, reliable technological machines and equipment for food production.
Learning Outcomes
ON7 To perform calculation, design and modernization of technological equipment of enterprises
Learning outcomes by discipline
1) Performs calculations of technological equipment of food production for strength, rigidity, stability, endurance and fluctuations;
2) Analyzes the stress-strain state of the main components and parts of technological equipment of food production;
3) Calculates and designs parts and components of technological equipment of food production in accordance with the terms of reference using standard design automation tools.
Prerequisites
The quality management system Reliability of technological machines Interchangeably
Postrequisites
Prediploma practice Manufacturing practice III

Prediploma practice

Discipline cycle	Profiling discipline
Course	3
Credits count	15
Knowledge control form	Total mark on practice

Short description of discipline

Prediploma practice is a purposeful and active work of a student to collect the necessary material to complete a graduation project, obtain and consolidate design skills. The student collects material on the history of the issue in accordance with the topic of the diploma project, performs a patent search to identify analogues and prototypes and establishes their disadvantages and advantages, a feasibility study and calculation of the economic efficiency of the designed equipment.

Purpose of studying of the discipline

The objectives of the undergraduate practice are purposeful and active work of the student to collect the necessary material for the diploma project, obtaining and securing design skills.

Learning Outcomes

ON8 Develop projects of workshops and sites of industrial enterprises
ON9 Apply engineering knowledge to develop and implement projects that meet the specified requirements

Learning outcomes by discipline

1) Shows the ability to work effectively both individually and as a team member;
2) Applies knowledge of design methods;
3) Designs technological machines and equipment.

Prerequisites

Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

Postrequisites

Final examination

Manufacturing practice III

Discipline cycle	Profiling discipline
Course	3
Credits count	15
Knowledge control form	Total mark on practice

Short description of discipline

Manufacturing practice 3 is the consolidation and deepening of theoretical knowledge gained after studying the core disciplines and the acquisition of practical skills and competencies in the field of professional activity and the training of competitive specialists to work in the field of technological machines and equipment. Consolidation of experience and skills in production and technological, organizational and managerial, installation and commissioning, calculation and design, experimental and research activities acquired during the study of profile disciplines.

Purpose of studying of the discipline

The objectives of the production practice are to consolidate and deepen the theoretical knowledge gained after studying the core disciplines and to acquire practical skills and competencies in the field of professional activity and to train competitive specialists to work in the field of technological machines and equipment.

Learning Outcomes

ON8 Develop projects of workshops and sites of industrial enterprises
ON9 Apply engineering knowledge to develop and implement projects that meet the specified requirements

Learning outcomes by discipline

1) Shows the ability to work effectively both individually and as a team member;
2) Applies knowledge of structures, the principle of operation, the main technical characteristics of technological machines and equipment;
3) Carries out installation, operation and repair of technological machines and equipment.

Prerequisites

Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises Engineering of confectionery industry enterprises Engineering of meat industry enterprises Engineering of public catering enterprises

Postrequisites

Final examination