

## The list of academic disciplines of the university component

**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**

**Developed**

By the Academic Committee of the EP  
The head of the AC Nurymkhan Gulnur Nesiptaevna  
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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  
Recommended for approval by the Academic Council of the University  
Protocol № 1 06.06.2024

**Approved**

at a meeting of the University Academic Council by protocol No. 6/1 of January 19, 2024.

at a meeting of the University Academic Council by protocol No. 11 of June 28, 2024.  
Chairman of the Academic Council of the University Orynbekov D.R.

## Bases of economics, law and ecological knowledge

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

### Short description of discipline

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

### Purpose of studying of the discipline

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

### Learning Outcomes

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

### Learning outcomes by discipline

- 1) Analyzes the issues of safety and preservation of the natural environment as the most important priorities of life;*
- 2) Shows knowledge of the basics of environmental management and sustainable development, assesses the impact of man-made systems on the environment;*
- 3) Shows knowledge of the main regulatory legal acts of the Republic of Kazakhstan, their understanding and application;*
- 4) Demonstrates knowledge of the laws of the development of economic processes, clearly formulates his own position, finds and clearly sets out arguments in its defense;*
- 5) Is able to characterize the types of entrepreneurial activity and the entrepreneurial environment, draw up a business plan, create an entrepreneurial structure and organize its activities;*
- 6) Knows the fundamental provisions about the role of leadership in managing large and small social groups.*

### Prerequisites

*School course*

### Postrequisites

*Basic and profile disciplines of the EP*

## Introduction to Specialty

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

### Short description of discipline

*This course provides students with knowledge about the history of the development of food production in the Republic of Kazakhstan. Students will study the main characteristics of raw materials of animal and vegetable origin; general information about the processes and technology of food production. Students will receive an overview of the classification and basic requirements for technological equipment; about the job responsibilities of engineering and technical staff. As a result, students will be able to classify the branches of the food industry, describe the characteristics of food raw materials and products, identify technological machines and equipment of food production.*

### Purpose of studying of the discipline

*Introducing students to the food industries, with the main types of products, development of the terminology used in the technical specifications in the food industry, the introduction of the principle of action and the main technical characteristics of production machines and equipment.*

### Learning Outcomes

*ON7 To perform calculation, design and modernization of technological equipment of enterprises*

### Learning outcomes by discipline

- 1) Classifies food industry branches*
- 2) Describes the characteristics of food raw materials and products*
- 3) Identifies technological machines and equipment of food production*

### Prerequisites

*Physics*

### Postrequisites

*Educational practice*

## Mathematics

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

### Short description of discipline

*The purpose of this course is to provide students with fundamental training in mathematics. The course is aimed at forming a sufficiently*

high culture of mathematical thinking among students and developing the ability to creatively approach problem solving. In addition to studying the fundamental foundations of higher mathematics (elements of analytical geometry, linear algebra, mathematical analysis, differential equations), the course assumes consideration of various applications of mathematics to solving production problems from the field of professional specialization.

### **Purpose of studying of the discipline**

Creation of the basis for the development of logical thinking and mathematical culture. Formation of basic knowledge and acquisition of basic skills of using mathematical apparatus for solving theoretical and applied problems, as well as the necessary level of mathematical training for mastering other applied disciplines studied within a specific profile; skills of working with special mathematical literature

### **Learning Outcomes**

ON2 Apply the basic laws of natural science disciplines for mastering technological processes in food production

### **Learning outcomes by discipline**

- 1) Applies modern mathematical methods to solve applied problems
- 2) Creates algorithms for solving professional problems by mathematical methods
- 3) Plans activities aimed at solving research tasks
- 4) Selects methods of mathematical analysis and modeling, theoretical and experimental research of applied problems
- 5) Uses mathematical symbolism to express quantitative and qualitative relations of objects
- 6) Applies methods of visual graphical representation of research result

### **Prerequisites**

School course

### **Postrequisites**

Basic and profile disciplines of the EP

## **General technology of food production**

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

### **Short description of discipline**

Attracting students to active learning will allow them to master the types of plant and animal raw materials and their classification in this course. The main technological operations (mechanical, thermal, physical, chemical, microbiological), food production technologies with the latest operations and cycles are considered. Applying knowledge of natural sciences, the student evaluates the physico-chemical parameters of food products, chooses methods of technochemical quality control of raw materials, semi-finished products and finished products, determines the properties of raw materials and semi-finished products that affect the optimization of technological processes and the quality of finished products.

### **Purpose of studying of the discipline**

The purpose of studying the discipline "General technology of food production" is to give an idea of the general technology of food production, the chemical composition, the nutritional and biological value of food products, the processes occurring during the storage of food products, their production technology.

### **Learning Outcomes**

ON2 Apply the basic laws of natural science disciplines for mastering technological processes in food production

### **Learning outcomes by discipline**

- 1) Assesses the physical and chemical parameters of food products
- 2) Selects methods of technochemical quality control of raw materials, semi-finished products and finished products
- 3) Determines the properties of raw materials and semi-finished products that affect the optimization of technological processes and the quality of finished products

### **Prerequisites**

School course

### **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

## **Physics**

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

### **Short description of discipline**

The purpose of the discipline is to study the basic physical phenomena, concepts and laws of general physics that are necessary for mastering technological processes in food production. The student, performing practical and laboratory work, evaluates the degree of reliability of the results obtained using experimental research methods, applies knowledge of the basic laws of physics in solving professional problems, uses various physical concepts, laws, theories in practical activities.

### **Purpose of studying of the discipline**

Formation of ideas about the role of experimental and theoretical methods of cognition of the surrounding world, development of skills for independent solving of physical problems, motivation to study modern scientific literature.

### **Learning Outcomes**

ON2 Apply the basic laws of natural science disciplines for mastering technological processes in food production

### **Learning outcomes by discipline**

- 1) Assesses the degree of reliability of the results obtained using experimental research methods;
- 2) Uses various physical concepts, laws, theories in practice;
- 3) Applies knowledge of the basic laws of physics in solving professional problems.

## Prerequisites

School course

## Postrequisites

Basic and profile disciplines of the EP

## Educational practice

Discipline cycle	Basic disciplines
Course	1
Credits count	2
Knowledge control form	Total mark on practice

### Short description of discipline

The student, as a result of passing the training practice, consolidates the theoretical knowledge obtained in the study of natural science disciplines for the development of technological processes in the production of food. The student gets an idea of the technology, organization and mechanism of work at a food enterprise, gets acquainted with the work of the main divisions of food enterprises. The student keeps a diary of the internship. Based on these records, an internship report is then compiled.

### Purpose of studying of the discipline

The purpose of the training practice is to familiarize students with the primary concepts of technology, organization and mechanism of work at the food enterprise, familiarization of students with the work of the main divisions of food enterprises.

### Learning Outcomes

ON2 Apply the basic laws of natural science disciplines for mastering technological processes in food production

### Learning outcomes by discipline

- 1) Demonstrates knowledge of basic technological machines and equipment for food production
- 2) Assesses the level of equipment of the enterprise by means of mechanization
- 3) Analyzes the activities of divisions of food production enterprises

### Prerequisites

Introduction to Specialty

### Postrequisites

Mechanical and hydro-mechanical processes and apparatus of food production

## Interchangeability, standardization and technical measurements

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

### Short description of discipline

In this course, concepts such as interchangeability, dimensions and dimensional chains, tolerances and landings; selection of tolerances and landings; normalization of shape deviations; normalization of the accuracy of the relative position of surfaces and axes; normalization of surface roughness; rolling bearing landings; the order of choice of bearing landings; interchangeability of threaded connections, tolerances and landings of metric threads; interchangeability of keyways are studied connections; normalization of the accuracy of gears and gears.

### Purpose of studying of the discipline

The purpose of studying the discipline is to master the methods of ensuring interchangeability and its methodological foundations, taking into account the specific operating conditions of products. Studying the discipline will allow future bachelors to provide the necessary level of machine design.

### 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 standard test methods to determine the physical and mechanical properties of the materials used and finished products
- 3) Defines the nomenclature of measured and controlled parameters of products and technological processes, establishes optimal standards for measurement accuracy and control reliability

### Prerequisites

Mathematics Physics

### Postrequisites

Basics of construction and machine parts

## Basics of scientific research

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

### Short description of discipline

In this course, general information about the development of science is studied; general scientific and special methods of conducting scientific research are considered, the basic principles of organizing and planning students' scientific work, general requirements for the structure, content and design of student scientific papers. As a result of the training, students develop the ability to find, process and store information obtained during the study of scientific literature, design student research papers, preparation and protection of student scientific work.

### Purpose of studying of the discipline

Development of students skills in research activities; familiarization of students with scientific knowledge, their readiness and ability to

conduct research.

### **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) Searches for scientific and technical information on the research topic
- 2) Publishes the results of scientific research
- 3) Draws up documentation for participation in scientific projects

#### **Prerequisites**

Physics

#### **Postrequisites**

Patenting Fundamentals of innovation and patenting Intellectual property in quality management

## **Technology of construction materials**

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

#### **Short description of discipline**

The purpose of studying the discipline is to study the methods of obtaining, testing, changing the properties and processing of structural materials used in the design of mechanical systems, taking into account their operating conditions. Students will master the methods of processing structural materials used in the design, manufacture, operation and repair of technological equipment. As a result of studying the discipline, students will be competent in improving the quality and properties of structural materials used in the production and maintenance of technological machines and equipment of the food industry.

#### **Purpose of studying of the discipline**

The purpose of studying the discipline is to master the methods of ensuring interchangeability and its methodological foundations, taking into account the specific operating conditions of products. Studying the discipline will allow future bachelors to provide the necessary level of machine design.

#### **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 standard test methods to determine the physical and mechanical properties of the materials used and finished products
- 3) Defines the nomenclature of measured and controlled parameters of products and technological processes, establishes optimal standards for measurement accuracy and control reliability

#### **Prerequisites**

Physics

#### **Postrequisites**

Basics of construction and machine parts

## **Basics of Heat Engineering**

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

#### **Short description of discipline**

In this course, the basic concepts of thermal engineering are studied: thermodynamic system; equation of state; first law of thermodynamics; internal energy; work of volume change; external work; second law of thermodynamics; exergy of heat; ideal gases; real gases, water vapor, moist air; fundamentals of the theory of heat transfer; thermal conductivity; convection; thermal radiation; heat transfer; heat transfer through a flat wall; heat transfer through a cylindrical wall; types of heat exchangers; calculation of heat exchangers.

#### **Purpose of studying of the discipline**

The purpose of studying the discipline "Fundamentals of Heat Engineering" is to acquire students' skills in using the laws of thermodynamics and heat transfer in solving practical problems related to technological thermal processes and the principles of thermal and refrigerating devices.

#### **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) Performs thermodynamic calculations of work processes in heat power plants and other heat engineering installations used in the food industry

#### **Prerequisites**

Physics

#### **Postrequisites**

Thermal and mass transfer processes and apparatus of food production

## **World of Abai**

Discipline cycle	Basic disciplines
Course	2

Credits count	3
Knowledge control form	Examination

### Short description of discipline

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

### Purpose of studying of the discipline

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

### Learning Outcomes

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

### Learning outcomes by discipline

- 1) Analyzes the philosophical and artistic foundations of works, historical facts related to the creative heritage of Abai Kunanbayev, Shakarim Kudaiberdiyev, Mukhtar Auezov
- 2) Uses in practice the humanistic ideas of Abai's philosophical and artistic works
- 3) Assesses the place and significance of Abai's works in the history of literature and science

### Prerequisites

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

### Postrequisites

Basic and profile disciplines of the EP

## Basics of construction and machine parts

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

### Short description of discipline

In this course, the basics of designing and calculating standard parts and mechanical gears are studied; shafts and axles; design and verification calculation of shafts; calculation and selection of bearings; elastic, blind, compensating, controlled couplings; threaded connections, calculation of the strength of threaded connections; keyway connections; spline connections; welded joints; calculation of gears; calculation of worm gears; calculation of belt gears; calculation of chain gears.

### Purpose of studying of the discipline

The aim of the discipline is to complete the formation of skills of optimal decision-making when choosing the most rational materials, shapes, sizes, degrees of accuracy and surface roughness, as well as technical conditions of manufacture, Assembly and requirements for the operation of parts and Assembly units.

### 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 standard calculation methods in the design of parts and assemblies of mechanical engineering products
- 3) Develops and uses graphic technical documentation

### Prerequisites

Interchangeability, standardization and technical measurements

### Postrequisites

Engineering of dairy industry enterprises Engineering of food industry enterprises Engineering of oil and fat industry enterprises