NJSC SHAKARIM UNIVERSITY OF SEMEY

EDUCATIONAL PROGRAM

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)

Semey

Educational program

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Semey 2024

PREFACE

Developed

The educational program 6B07109 - Food Engineering in the direction of preparation 6B071 - Engineering and Engineering affairs on the basis of the State Compulsory Standards of Higher and Postgraduate Education approved by the Order of the Ministry of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022 No 2 (as amended by the order) was developed by the Academic Committee dated 20.02.2023 No 66).

Members of the Academic Committee	Full name	Academic degree, academic title, position
Head of the Academic Committee	Nurymkhan Gulnur Nesiptayevna	Dean of the Research School of Food Engineering, Ph.D.
Educational program manager	Tussipov Nurlan Orazkhanovich	Teacher of the department Technological equipment
Member of the AC	Abdilova Galiya Bekenovna	Head of the Department of Technological Equipment, PhD
Member of the AC	Ibragimov Nadir Kadyrovich	Teacher of the department Technological equipment, Candidate of Technical Sciences
Member of the AC	Zhuketai Serikbosyn Berikboluly	regional manager Qazaq LLP Astyq Group, Master
Member of the AC	Yesimbekov Zhanibek Serikbekovich	Semey branch of Kazakh Research Institute of Processing and Food Industry LLP, head of the scientific project, PhD
Member of the AC	Habidulla Yersultan Habidullauly	student of the TO-101 group
Member of the AC	Turlykhanova Dilnaz Dauletqyzy	student of the TO-201 group

Reviewing

Full name of the reviewer	Position, place of work
Bisimbayev Zhumabek Ibraikhanovich	Chief Mechanic of Kondiz distribution LLP
Vyacheslav Anatolyevich Perebeynos	Chief Mechanic of JSC East Kazakhstan Flour and Feed Mill

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.

Content

1.Introduction

1.1.General data

The educational program 6B07109 Food Engineering was developed by the Department of Technological Equipment of the Research School of Food Engineering of the Shakarim Semey University.

In the message of the President of the Republic of Kazakhstan to the People of Kazakhstan dated September 1, 2023, "the task is to achieve a real breakthrough in the agro– industrial complex, to increase the share of processed products in the agro-industrial complex to 70% within three years. It is necessary to have enterprises capable of ensuring the scale, quality and regularity of deliveries. The priority should be promising areas for us: deep processing of meat, milk and grain." To solve the tasks set, new design capacities should appear in 12 regions of the country. Thus, projects in the food industry and agro– industrial complex are being implemented in the Abai region - the total investment volume will amount to 40.9 billion tenge. More than 1,1 thousand people will get jobs. The launch of the enterprises will be carried out in 2023-2025. In the East Kazakhstan region, it is planned to open 10 agro-industrial facilities with a total cost of 62.4 billion tenge. This will require providing new enterprises of the food and processing industry with engineering and technical personnel.

When implementing the educational program, it is planned to use artificial intelligence tools in the educational process, thereby developing digital competencies among students in a rapidly changing technological environment.

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

1.2.Completion criteria

The main criterion for the completion of the educational process in the field of training 6B071 - Engineering and Engineering is the development of at least 205 credits of theoretical training, as well as at least 27 credits of practical training, 8 credits of final certification.
Total 240 credits.

1.3.Typical study duration: Typical training period: 3 years

2.PASSPORT OF THE EDUCATIONAL PROGRAM

2.1.EP purpose	Training of competitive specialists to work in the field of engineering of food and processing enterprises, able to adapt to rapidly changing socio-economic conditions, as well as meeting the needs of the individual in comprehensive professional and intellectual development
2.2.Map of the training profile within the educational program	
Code and classification of the field of education	6B07 - Engineering, manufacturing and construction industries
Code and classification of the direction of training	6B071 - Engineering and Engineering affairs
Code in the International Standard Classification of Education	0710
Code and classification of the educational program group	B064 - Mechanics and metal working
Code and name of the educational program	6B07109 - Food Engineering
2.3.Distinctive features of the OP (double degree/joint, OVPO-partner, Double major, innovative)	no
2.4.Qualification characteristics of the graduate	
Degree awarded / qualification	Bachelor of Engineering and Technology in the educational program 6B07109 Food Engineering
Name of professional standard	1. Confirmation of conformity of machinery and equipment on 12/30/2019 2. Conducting tests on 12/30/2019 3. Slaughter and processing of cattle meat (cattle) 11.12.2018
Atlas of new professions	absent
Regional standard	absent
Name of the profession / list of positions of a specialist	mechanic; mechanical engineer; designer; design engineer; technologist; Research Associate
OQF qualification level (industry qualification framework)	6
Area of professional activity	- organizations, enterprises of the food and processing industry; - state management bodies; - design and research organizations; - firms of various forms of ownership
Object of professional activity	- technological machines and equipment; - machine drive systems; - structural and operational materials; - equipment for operation, maintenance and repair of technological machines; - equipment for automating the working processes of machines; - machinery design equipment
Types of professional activity	Production and technological activity: - organization of workplaces, their technical

	equipment; - placement of technological equipment and maintenance of technological equipment. Service and operational activities: - setting up and maintenance of technological machines and equipment; - checking the technical condition and residual life of technological machines and equipment; - organizing a system of preventive inspections and scheduled preventive repairs. Organizational and managerial activities: - preparation of technical documentation (work schedules, instructions, plans, estimates, applications for materials, equipment, etc.), as well as established reporting on approved forms; - organization of work of small groups of performers. Installation and commissioning activities: - commissioning, adjustment, adjustment and pilot testing of technological machines and equipment; - installation, commissioning, testing and operation of technological machines and equipment. Settlement and design activities: - calculation and design of parts and assemblies in accordance with the terms of reference using standard design automation tools; - development of design and working documentation, registration of completed design works. Experimental research activity: - the study of scientific and technical information, domestic and foreign experience on the subject of research; - preparation of a report on the completed task, participation in the implementation of research and development results.
2.5.Graduate Model	Graduate Model Graduate educational program «6B07109 Food Engineering» capable of: - demonstrate socio-cultural, economic and legal, environmental knowledge, communication skills; - to apply information technologies taking into account modern trends in the development of society; - apply the basic laws of natural science disciplines for mastering technological processes in food production; - develop design documentation; - apply standard methods of designing mechanical systems taking into account their operating conditions; - to calculate hydraulic systems, water and heat supply systems; - to carry out installation, operation and repair of technological machines and equipment; - modify technological equipment of enterprises; - develop projects of workshops and sites of industrial enterprises; - apply engineering knowledge to develop and

	implement projects that meet the specified requirements.

3.Modules and content of the educational program

Module 1. Fundamentals of social and humanitarian knowledge

Brief description of the module content

This module reveals such aspects as: socio-cultural, economic-legal, environmental knowledge, communication skills, the use of information technology taking into account modern trends in the development of society.

Module disciplines

Foreign language

Kazakh(Russian) language (1)

Bases of economics, law and ecological knowledge

Physical Culture

Foreign language

History of Kazakhstan

Kazakh(Russian) language (2)

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

Physical Culture

Physical Culture

World of Abai

Information and communication technology

Physical Culture

Philosophy

Module 2. Natural science disciplines for mastering technological processes

Brief description of the module content

This module includes natural science disciplines, the study of which will allow the application of their basic laws for the development of technological processes in the production of food and the operation of technological equipment

Module disciplines

Mathematics

Physics

Educational practice

General technology of food production

The methods of experimental data processing

Module 3. Development of design documentation

Brief description of the module content

Studying the disciplines included in this module will allow students to gain skills in developing design documentation and feasibility studies of design solutions

Module disciplines

Descriptive geometry and engineering graphics

Theoretical and Applied Mechanics

Theoretical mechanics

Basics of scientific research

Manufacturing practice I

Fundamentals of industrial construction

Computer-Aided Design of Technological Machines

Engineering Technology

Module 4. Design of mechanical systems

Brief description of the module content

Studying the disciplines of this module will allow students to acquire the skills of calculation and design activities in the design of parts and assemblies in accordance with the terms of reference

Module disciplines

Interchangeability, standardization and technical measurements

Technology of construction materials

Theory of mechanisms and machines

Bases of calculation elements of machine

Strength of materials

Fundamentals of innovation and patenting

Basics of construction and machine parts

Patenting

Module 5. Calculation of hydraulic systems, water and heat supply systems

Brief description of the module content

This module includes disciplines the study of which will form students` skills in calculating hydraulic systems, water and heat supply systems for both technological equipment and, in general, enterprises of the food and processing industry

Module disciplines

Basics of Heat Engineering

Hydraulics

Fluid dynamics and heat and mass transfer

Mechanization of loading and unloading and transport and storage operations

Fluid and gas mechanics

Mechanical and hydro-mechanical processes and apparatus of food production

Physical methods of processing foods

Fundamentals of mathematical and computer modeling of technological processes

Bases of water supply, sewerage and thermal networks

Thermal and mass transfer processes and apparatus of food production

Physico-chemical methods of water preparation

Power systems life support

Heat and Mass Transfer

Module 6. Installation, operation and repair of technological machines and equipment

Brief description of the module content

The study of the disciplines of this module will form students` skills in installation and commissioning activities: skills in setting up, adjusting and expertly checking technological machines and equipment, skills in their installation, repair, commissioning, testing and operation

Module disciplines

Reliability of technological machines

Interchangeably

The quality management system

Installation and operation of technological machines

Control Theory

Electrical engineering

Hydropneumatic machines and drives

Fundamentals of scientific research

Manufacturing practice II

Repair technological machines

Automation and automated control systems

Basics of artistic design

Module 7. Technological equipment of enterprises

Brief description of the module content

The study of the disciplines of this module will form students` skills in production and technological activities for the organization of workplaces and their technical equipment, placement and maintenance of technological equipment, calculation, design and modernization of technological equipment of food and processing enterprises

Module disciplines

Introduction to Specialty

Intellectual property in quality management

Equipment for heating and cooling processing of meat and dairy products

Equipment for heating and cooling processing of food products

Engineering of oil and fat industry enterprises

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

Machines, automats and flow lines of the food industries

Engineering of confectionery industry enterprises

Engineering of dairy industry enterprises

Engineering of meat industry enterprises

Engineering of public catering enterprises

Engineering of food industry enterprises

Design of machines for mechanical processing of food raw materials

Design of equipment for small food production enterprises

Design of technological machines and equipment

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

Calculation and design of technological equipment of the food production

Module 8. Development of projects of workshops and sites of industrial enterprises

Brief description of the module content

The study of the disciplines of this module forms students` skills in developing projects for workshops and sites of food and processing enterprises and calculating their technical and economic efficiency

Module disciplines

Organization and planning of production

Cost management

Economics of enterprise

Engineering of ventilation systems of meat and dairy industry enterprises

Engineering of ventilation systems of food industry enterprises

Design engineering of meat and dairy industry enterprises

Design engineering of food industry enterprises

Prediploma practice

Manufacturing practice III

Final examination

Brief description of the module content

Writing and defending a graduation project or preparing and passing a comprehensive exam.

Module disciplines

Comprehensive exam

Diploma project

4.Summary table on the scope of the educational program

«6B07109 - Food Engineering»

Name of discipline	Cycle/ Component	Term	Number of credits	Total hours	Lec	SPL	LC	IWST	IWS	Knowledge control form
Module 1. Fundamentals of social and humanitarian knowledge										
Foreign language	GER/CC	1	5	150		45		35	70	Examination
Kazakh(Russian) language (1)	GER/CC	1	5	150		45		35	70	Examination
Bases of economics, law and ecological knowledge	GER/US	1	5	150	15	30		35	70	Examination
Physical Culture	GER/CC	1	2	60		60				Differentiated attestation
Foreign language	GER/CC	2	5	150		45		35	70	Examination
History of Kazakhstan	GER/CC	2	5	150	15	30		35	70	Qualification examination
Kazakh(Russian) language (2)	GER/CC	2	5	150		45		35	70	Examination
The module of socio-political knowledge (sociology, political science, cultural studies, psychology)	GER/CC	2	8	240	30	45		55	110	Examination
Physical Culture	GER/CC	2	2	60		60				Differentiated attestation
Physical Culture	GER/CC	3	2	60		60				Differentiated attestation
World of Abai	BS/US	3	3	90	15	15		20	40	Examination
Information and communication technology	GER/CC	4	5	150	15	15	15	35	70	Examination
Physical Culture	GER/CC	4	2	60		60				Differentiated attestation
Philosophy	GER/CC	5	5	150	15	30		35	70	Examination
Module 2. Natural science disciplines for mastering technological processes										
Mathematics	BS/US	1	5	150	15	30		35	70	Examination
Physics	BS/US	1	3	90	15	15		20	40	Examination
Educational practice	BS/US	2	2	60						Total mark on practice
General technology of food production	BS/CC	2	5	150	15	30		35	70	Examination
The methods of experimental data processing	BS/CCh	4	5	150	15		30	35	70	Examination
Module 3. Development of design documentation										
Descriptive geometry and engineering graphics	BS/CCh	1	7	210	30	45		45	90	Examination
Theoretical and Applied Mechanics	BS/CCh	1	7	210	30	45		45	90	Examination
Theoretical mechanics	BS/CCh	1	7	210	30	45		45	90	Examination
Basics of scientific research	BS/US	2	3	90	15	15		20	40	Examination
Manufacturing practice I	BS/CC	2	3	90						Total mark on practice

Fundamentals of industrial construction	BS/CCh	3	5	150	15	30		35	70	Examination
Computer-Aided Design of Technological Machines	BS/CCh	3	5	150	15	30		35	70	Examination
Engineering Technology	BS/CCh	3	5	150	15	30		35	70	Examination
Module 4. Design of mechanical systems										
Interchangeability, standardization and technical measurements	BS/US	2	5	150	15	15	15	35	70	Examination
Technology of construction materials	BS/US	2	5	150	15	15	15	35	70	Examination
Theory of mechanisms and machines	BS/CCh	3	5	150	15	30		35	70	Examination
Bases of calculation elements of machine	BS/CCh	3	5	150	15	30		35	70	Examination
Strength of materials	BS/CCh	3	5	150	15	30		35	70	Examination
Fundamentals of innovation and patenting	BS/CCh	4	5	150	15	30		35	70	Examination
Basics of construction and machine parts	BS/US	4	5	150	15	15	15	35	70	Examination
Patenting	BS/CCh	4	5	150	15	30		35	70	Examination
Module 5. Calculation of hydraulic systems, water and heat supply systems										
Basics of Heat Engineering	BS/US	3	5	150	15	15	15	35	70	Examination
Hydraulics	BS/CCh	3	5	150	15	30		35	70	Examination
Fluid dynamics and heat and mass transfer	BS/CCh	3	5	150	15	30		35	70	Examination
Mechanization of loading and unloading and transport and storage operations	BS/CCh	3	5	150	15	30		35	70	Examination
Fluid and gas mechanics	BS/CCh	3	5	150	15	30		35	70	Examination
Mechanical and hydro-mechanical processes and apparatus of food production	BS/CCh	3	5	150	15	30		35	70	Examination
Physical methods of processing foods	BS/CCh	3	5	150	15	30		35	70	Examination
Fundamentals of mathematical and computer modeling of technological processes	BS/CCh	4	5	150	15	30		35	70	Examination and term work/Project
Bases of water supply, sewerage and thermal networks	BS/CCh	4	5	150	15	30		35	70	Examination
Thermal and mass transfer processes and apparatus of food production	BS/CCh	4	5	150	15	30		35	70	Examination and term work/Project
Physico-chemical methods of water preparation	BS/CCh	4	5	150	15	30		35	70	Examination
Power systems life support	BS/CCh	4	5	150	15	30		35	70	Examination
Heat and Mass Transfer	AS/CCh	4	5	150	15	30		35	70	Examination
Module 6. Installation, operation and repair of technological machines and equipment										
Reliability of technological machines	BS/CCh	3	5	150	15	30		35	70	Examination
Interchangeably	BS/CCh	3	5	150	15	30		35	70	Examination
The quality management system	BS/CCh	3	5	150	15	30		35	70	Examination
Installation and operation of technological machines	AS/CCh	3	5	150	15		30	35	70	Examination

Control Theory	AS/CCh	3	5	150	15		30	35	70	Examination
Electrical engineering	AS/CCh	3	5	150	15		30	35	70	Examination
Hydropneumatic machines and drives	BS/CCh	4	5	150	15		30	35	70	Examination
Fundamentals of scientific research	BS/CCh	4	5	150	15		30	35	70	Examination
Manufacturing practice II	BS/CC	4	7	210						Total mark on practice
Repair technological machines	AS/CCh	4	5	150	15		30	35	70	Examination
Automation and automated control systems	AS/CCh	4	5	150	15		30	35	70	Examination
Basics of artistic design	AS/CCh	4	5	150	15		30	35	70	Examination
Module 7. Technological equipment of enterprises										
Introduction to Specialty	BS/US	1	3	90	15	15		20	40	Examination
Intellectual property in quality management	BS/CCh	4	5	150	15	30		35	70	Examination
Equipment for heating and cooling processing of meat and dairy products	AS/CCh	4	5	150	15	30		35	70	Examination
Equipment for heating and cooling processing of food products	AS/CCh	4	5	150	15	30		35	70	Examination
Engineering of oil and fat industry enterprises	BS/CCh	5	5	150	15	30		35	70	Examination
Machines, automats and flow lines of the meat and dairy industries	BS/CCh	5	5	150	15	30		35	70	Examination
Machines, automats and flow lines of the food industries	BS/CCh	5	5	150	15	30		35	70	Examination
Engineering of confectionery industry enterprises	AS/CCh	5	5	150	15	30		35	70	Examination
Engineering of dairy industry enterprises	AS/CCh	5	6	180	30	30		40	80	Examination
Engineering of meat industry enterprises	AS/CCh	5	6	180	30	30		40	80	Examination
Engineering of public catering enterprises	AS/CCh	5	6	180	30	30		40	80	Examination
Engineering of food industry enterprises	AS/CCh	5	6	180	30	30		40	80	Examination
Design of machines for mechanical processing of food raw materials	AS/CCh	5	5	150	15	30		35	70	Examination
Design of equipment for small food production enterprises	AS/CCh	5	5	150	15	30		35	70	Examination
Design of technological machines and equipment	AS/CCh	5	5	150	15	30		35	70	Examination
Calculation and design of technological equipment of the meat and dairy production	AS/CCh	5	5	150	15	30		35	70	Examination and term work/Project
Calculation and design of technological equipment of the food production	AS/CCh	5	5	150	15	30		35	70	Examination
Module 8. Development of projects of workshops and sites of industrial enterprises										
Organization and planning of production	BS/CCh	3	3	90	15	15		20	40	Examination
Cost management	BS/CCh	3	3	90	15	15		20	40	Examination
Economics of enterprise	BS/CCh	3	3	90	15	15		20	40	Examination
Engineering of ventilation systems of meat and dairy industry enterprises	AS/CCh	5	5	150	15	30		35	70	Examination
Engineering of ventilation systems of food industry enterprises	AS/CCh	5	5	150	15	30		35	70	Examination
Design engineering of meat and dairy industry enterprises	AS/CCh	5	5	150	15	30		35	70	Examination

Design engineering of food industry enterprises	AS/CCh	5	5	150	15	30		35	70	Examination
Prediploma practice	AS/CCh	6	15	450						Total mark on practice
Manufacturing practice III	AS/CCh	6	15	450						Total mark on practice
Final examination										
Comprehensive exam		6	8	240						
Diploma project		6	8	240						

NON -PROFIT LIMITED COMPANY «SHAKARIM UNIVERSITY OF SEMEY»

EDUCATIONAL PROGRAM DEVELOPMENT PLAN

6B07109 – «Food Engineering»

for 2024 - 2027

Semey 2024

Content

1. Passport of the Development Plan of the Bachelor's degree 6B07109 – «Food Engineering»

1	The basis for the development	Development program of the Non -Profit Limited Company «Shakarim University of Semey» for 2023-2029. School work plan
2	Terms of implementation	2024-2027 years
3	Expected results of implementation	Formation of a qualified specialist and a "perfect personality" who has absorbed national values. Training of competitive specialists to work in the field of engineering of food and processing enterprises, able to adapt to rapidly changing socio-economic conditions, as well as meeting the needs of the individual in comprehensive professional and intellectual development

2. Analytical justification of the EP

2.1 Information about the educational program

The educational program has been developed in accordance with the National Qualifications Framework and Professional Standards, according to the Dublin Descriptors and the European Qualifications Framework. The typical period of mastering the bachelor's degree program is 3 years.

The main criterion for the completion of the educational process is the development of at least 240 credits, with the award of a Bachelor of Engineering and Technology degree in the educational program 6B07109 – «Food Engineering».

The educational program 6B07109 – «Food Engineering» is aimed at training competitive specialists to work in the field of technological machines and equipment of the food and meat and dairy industry, capable of quickly adapting to rapidly changing socio-economic conditions, as well as meeting the needs of the individual in comprehensive professional and intellectual development**.**

Preparation of bachelors in EP 6B07109 – «Food Engineering» is carried out by the Department of «Technological equipment » of Research School of Food Engineering on the basis of:

- Appendices to License No. KZ38LAA00018432, issued on 25.06.2020,
- Law of the Republic of Kazakhstan dated July 27, 2007 No. 319-III "On Education";
- Standard rules of activity of educational organizations of the corresponding types approved by the Order of the Minister of Education and Science of the Republic of Kazakhstan dated October 30, 2018 No. 595;
- State mandatory standards of higher and postgraduate education. Order of the Ministry of Internal Affairs of the Republic of Kazakhstan No. 2 dated 20.07.2022; AP 042-1.01 -2021 Ed. No. 3 dated September 12, 2022.
- Rules of the organization of the educational process on credit technology of training. Order of the Ministry of Education of the Republic of Kazakhstan dated 20.04.2011 No. 152;

- Rules of the organization of the educational process on distance learning technologies, approved by the Order of the Minister of Education and Science of the Republic of Kazakhstan dated March 20, 2015 No. 137;
- Standard rules for admission to training in educational organizations implementing professional training programs of higher education, approved by the Decree of the Government of the Republic of Kazakhstan dated October 31, 2018 No. 600;
- The State Program for the Development of Education and Science of the Republic of Kazakhstan for 2020 - 2025, approved by the Decree of the Government of the Republic of Kazakhstan on December 27, 2019 No. 988.

The educational program has been developed in accordance with the National Qualifications Framework and Professional Standards, coordinated with the Dublin Descriptors and the European Qualifications Framework.

EP 6B07109 – «Food Engineering» is implemented through curricula, a catalog of elective disciplines, a list of disciplines of the university component, syllabuses of disciplines, as well as methodological guidelines for laboratory and practical classes.

2.2 Information about students

Academic year / The basis of training	2024-2025 academic year	2025-2026 academic year	2026-2027 academic year
Grant	10	20	30
Contract	0	0	0
Total	10	20	30

2.3 Internal and external conditions for the development of EP

The academic policy of the Department «Technological equipment », implementing EP 6B07109 – «Food Engineering», is aimed at using innovative teaching technologies based on the best practice of teaching modern general education, basic and profile disciplines, on the quality of teaching using modern learning strategies, modern teaching methods in higher education. Students and teaching staff of the department «Technological equipment » have unlimited access to information and educational resources and electronic library systems necessary to perform independent educational and research work. Electronic information resources: full access to databases – Scopus, ScienceDirect, the Electronic Library System "Polpred", Cyberleninka, the Presidential Library named after B.N. Yeltsin, as well as limited access to some electronic databases.

Educational and laboratory classrooms of the department « Technological equipment » are equipped with modern equipment, comply with current sanitary standards, fire safety requirements, qualification requirements for the activities of educational organizations. These classrooms are used both for conducting classes in the disciplines of EP 6B07109 – «Food Engineering», and for independent work of students, completing course and diploma projects. EP 6B07109 – «Food Engineering» is sufficiently provided with basic methodological materials for the disciplines taught.

The classrooms of the Department «Technological equipment and mechanical engineering » are connected to the WI-Fi network for online conferences, lectures, seminars with the participation of leading scientists of Kazakhstan, near and far abroad. The Portal of educational resources of the Shakarim University is functioning . Families (http://ais.semgu.kz /), which contains lectures, videos, hyperlinks, tasks for self-examination, presentations on topics, textbooks and other educational and methodological content on the studied disciplines of the EP, the content of which the teaching staff uses in the classroom, and to which students have round-the-clock access. The most common innovative methods developed by teaching staff of departments for lecturing, conducting practical and laboratory classes, protection and pre-protection of graduation papers include: video lectures, slide presentations, working with an interactive whiteboard, using the COMPASS graphic editor, AutoCAD.

EP 6B07109 – «Food Engineering» is equipped for educational activities with 30 units of laboratory equipment in the form of industrial samples of machines and devices of the food industry, experimental installations and stands. This equipment is used for laboratory and practical training in the sub-disciplines "Technological equipment of meat industry enterprises", "Technological equipment of dairy industry enterprises", "Installation and operation of technological machines", "Repair of technological machines", "Machines, automatic machines and production lines".

For conducting classes in the discipline "Hydraulics" there are laboratory stands of the Spanish company "Edibon": Venturi, Bernoulli stands, a stand for determining the modes of fluid movement, determining hydraulic resistances, a stand for testing a centrifugal pump.

To conduct classes in the discipline "Technological processes and devices of food production", the laboratory is equipped with stands "Heat exchange", "Absorption", "Fluidization", "Centrifugation", "Drying". Every year, as part of the panorama of open classes, master classes on lectures and laboratory and practical classes in an interactive form are held.

All types of practices implemented within the framework of the EP are carried out according to the end-to-end program of practices approved by the Vice-rector for Academic Affairs, the academic calendar, contracts with databases of practices, as well as on the basis of 042- 1.10-2019 "Regulations on the practice of undergraduates /PhD students" and the order of the rector of the university. The bases of practices of EP 6B07105 – "Technological machines and equipment" are "Kondiz" LLP. Semnan LLP, SF KazNIIPPP LLP, IP Alteev. The practice bases meet the requirements and content of the practice.

2.4 Information about teaching staff implementing the educational program

The teaching staff of the department «Technological equipment and mechanical engineering», which provides the implementation of EP 6B07109 – «Food Engineering» is 7 people, including 1 doctors of Technical Sciences, 3 candidates of technical sciences, 1 PhD doctors, 2 teachers. The degree of the department is 72.0%.

The Department of Technological Equipment and Mechanical Engineering carries out the educational process at three levels of study: bachelor's degree, Master's degree and PhD doctorate. The formation of scientific and pedagogical personnel at the department is carried out by training through a master's degree, PhD doctoral studies, advanced training of the teaching staff.

EP teachers undergo advanced training in leading universities of Kazakhstan (according to the FPC plan) and training seminars held by the Ministry of Education and Science of the Republic of Kazakhstan, universities and other organizations. Teachers' training is confirmed by certificates and certificates. Teaching staff of the University undergo scientific internships in universities of far and near abroad, in universities and research institutes of the Republic of Kazakhstan. The qualified staff of teachers is able to provide a high-quality educational process, meets the qualification requirements, the level and specifics of the educational program.

PPS 6B07109 – «Food Engineering» participates in competitions for grant finalizing, program-targeted financing of projects, which are administered by the Ministry of Education and Science of the Republic of Kazakhstan, Ministry of Agriculture of the Republic of Kazakhstan, development institutes. The scientific direction of the department is connected with research in the field of improving technological machines and equipment, processes and devices of the food, meat and dairy and preprocessing industries. The teaching staff of the department has a high scientific and methodological publication activity. The results of the scientific activity of teachers are reflected in scientific publications with an impact factor. Scientists of the Department of "TOiM" have the Hirsch index (h-index) in the Web of sciences and Scopus databases.

№	Indicators	units of measurement	2024-2025 academic year	2025-2026 academic year	2026-2027 academic year
1	The share of teaching staff with an academic degree in EP	%	72	75	80
2	Including the share of teaching staff with a degree in the general education disciplines cycle	%	50	50	50

2.5 Characteristics of the achievements of the EP

EP 6B07109 - "Food engineering" in 2024 successfully passed the examination and was included in the Register of educational programs.

3. The main objectives of the EP development plan

In accordance with the Strategic Development Plan of the University for the effective implementation of EP 6B07109 – «Food Engineering», the following tasks are defined

• Providing high-quality training of competitive specialists

•Development and implementation of scientific projects

•Development of human resources

•Strengthening the material and technical base

•Development of international cooperation

The expected final results assume: participation in funded grant projects, the publication activity of teaching staff in rating publications with a non-zero impact factor, the development and operation of joint educational programs with foreign universities, the introduction of research results into the educational process, the involvement of students in research, academic mobility of students and teaching staff.

4. Risk analysis of EP

№	Name of risks	Measures to eliminate
1	Reduction of the contingent of students in the EP	Strengthening career guidance in schools, colleges and social networks
2	Insufficient level of language knowledge for the introduction of trilingual education	Attracting students and teaching staff to foreign language courses
3	Decrease in the level of employment	Strengthening work with employers, participation of students in job fairs, preparation of graduates' resumes
4	Insufficient development of external and internal academic mobility of students and teaching staff	Identification of partner universities for establishing internal and external academic mobility of students and teaching staff, establishing links with universities of the Republic of Kazakhstan and foreign universities.
5	The risk of reducing the settlement of teaching staff in the EP	An increase in the number of students enrolled in master's and PhD doctoral studies.
6	Obsolescence of the material and technical base	Systematic updating of the material base, submission of applications for new equipment

5. Action plan for the development of EP

№	Criteria	Expected results	units of measurement	2024-2025 academic year		2025-2026 academic year		2026-2027 academic year			
				plan	Actual implementation	plan	Actual implementation	plan	Actual implementation		
Direction 1. Educational and methodological support											
1.1	Updating the educational program based on professional standards, taking into account the recommendations of employers	Conducting an examination of the Educational program 6B07105 – "Technological machines and equipment" in order to improve the practice orientation and development of professional competencies of graduates	fact.	+		+		+			
1.2	Monitoring and updating catalogs of elective disciplines in accordance with the development of key and professional competencies, the demands of the labor market	Improving the quality of the content of educational programs by including elective courses aimed at developing the key and professional competencies of graduates in accordance with the demands of the labor market.	fact.	+		+		+			
1.3	Introduction of modern learning technologies into the educational process, contributing to the development of cognitive activity, communicative ability of students	Improving the quality of teaching academic disciplines, taking into account the novelty and diversity of forms of work that contribute to the development of cognitive activity.	fact.	+		-		-			

1.3.1	Introduction of mass open online courses (MOOCs) into the educational process according to the educational program 6B07105 – "Technological machines and equipment"	Introduction of disciplines into the educational process Improving the quality of teaching academic disciplines, taking into account the novelty and diversity of forms of work that contribute to the development of cognitive activity.	unit	**0**		**0**		**1**			
1.4	Involvement of social partners and employers in the development, examination of the implementation of educational programs	Improving the quality of educational programs implemented taking into account market demands and recommendations of employers	unit	**1**		**1**		**1**			
1.5	Development and implementation of elective courses in English	Introduction of disciplines in English into the educational process	unit	**0**		**0**		**0**			
1.6	Conducting seminars and round tables on the application of innovative technologies in the educational process	Introduction of innovative technologies in the educational process	unit	**1**		**1**		**1**			
1.7	Publication of educational, methodical and scientific literature on the implemented EP	Improvement of educational and methodological support in the disciplines of the implemented educational programs	unit	**1**		**1**		**1**			
1.8	Conclusion of contracts with foreign and domestic partner universities in order to develop academic exchange of students of all levels and teaching staff	Creation of a database of foreign and domestic partner universities for the development of academic exchange of students of all levels and teaching staff	unit	**0**		**0**		**1**			
1.9	Inviting students from partner universities to study for a semester, short-term internships, internships, etc.	Development of international recognition of educational programs, implementation of academic mobility programs for students	number of people	**0**		**0**		**0**			

1.10	Participation of teaching staff and students in international academic exchange programs	Development of international cooperation with foreign universities implementing educational programs in the direction 6B071 - Engineering and Engineering	number of people	**0**		**0**		**0**			
1.11	Development of outgoing academic mobility of teaching staff and students in the direction 6B071 - Engineering and Engineering	Improvement of the educational program based on the use of the experience of implementing such programs in the leading universities of the Republic of Kazakhstan	number of people	**1**		**1**		**1**			
Direction 2. Teaching staff											
2.1	Professional development and training of scientific and pedagogical personnel for the implementation of educational programs once every 5 years	The share of teaching staff who have passed advanced training at the national level is at least 20%	number of people	**2**		**2**		**2**			
2.2	Advanced training, retraining, internships of teaching staff at the international level	Completion of at least 2 teachers of the advanced training program, retraining, internships of teaching staff at the international level	number of people	**0**		**0**		**1**			
2.3	Promotion of publications of the works of teaching staff in international publications indexed by the Web of Science and Scopus databases	Increase in the share of teaching staff who have published the results of scientific research in publications indexed by the Web of Science and Scopus databases – at least 30% of the total number of teaching staff	%	**30**		**35**		**35**			
2.4	Involvement of practical specialists in teaching and scientific activities	Participation in the implementation of educational programs of practitioners (at least 20% of specialists)	%	**20**		**20**		**20**			
Direction 3. Internationalization of educational programs											
3.1	Conclusion of agreements on international cooperation with foreign universities	Implementation of joint projects, preparation of scientific publications with foreign partners, creation of bases for scientific internships of students	unit	**-**		**1**		**1**			

3.2	Attracting foreign students to study under the educational program 6B07105 – "Technological machines and equipment"	Increasing the number of foreign students	number of people	**-**		**-**		**-**			
3.3	Organization of joint scientific and practical events with international partners	Improving the efficiency of scientific and methodological activities of teaching staff, exchange of experience with foreign partners	unit	**0**		**0**		**1**			
3.4	Invitation of foreign specialists to give lectures and consultations on master's projects and dissertations	Improvement of the content component of educational programs based on the introduction of the experience of foreign specialists in the implementation of educational programs	unit	**0**		**0**		**1**			
3.5	Expansion of cooperation with Leading foreign scientific and educational organizations in order to attract the most qualified foreign specialists to the implementation of educational programs	Formation of key and professional competencies in accordance with the practice of leading universities	number of people	**-**		**-**		**-**			
Direction 4. Logistics and digitalization											
4.1	Step-by-step equipping of classrooms with technical training tools (projectors, panels, interactive and multimedia whiteboards, multifunctional devices, webcam, projector screen, etc.)	Equipping classrooms assigned to the department with technical training tools (projectors, panels, interactive and multimedia boards, multifunctional devices, webcam, projector screen, etc.)	unit	**1**		**1**		**1**			

4.2	Automation of the educational process (testing, session management, student contingent movement, dean's office, department, teaching staff load, schedule, library, syllabuses)	Information management based on the automation of the educational process (testing, session management, student contingent movement, dean's office, department, teaching staff load, schedule, library, syllabuses)	fact.	+		+		+			
4.3	Replenishment of the full-text database of research results of teaching staff and students, teaching staff (articles, monographs, etc.)	Increase in the number of results of scientific works of scientists, research of teaching staff and students, teaching staff (articles, monographs, etc.)	unit	**1**		**2**		**3**			
4.4	Expansion of the fund of scientific and educational literature, including on electronic media for implemented educational programs	Ensuring the implementation of educational programs based on modern educational and information resources, including on electronic media	%	**5**		**5**		**5**			
4.5	Monitoring the content and improvement of the faculty's website	Formation of the faculty's website on various aspects of the implementation of educational programs.	%	**50**		**50**		**50**			

Head of the Department _____ Abdilova G.B.

REVIEWED
at the meeting of the Commission on Academic Quality
of the Research School of Food Engineering
Protocol of the meeting No. 1 dated 06.06.2024
Chairman _____ Toleubekova S.S

AGREED
Dean _____ Nurymkhan G.N.
06.06.2024