NJSC SHAKARIM UNIVERSITY OF SEMEY

EDUCATIONAL PROGRAM

7M07 - Engineering, Manufacturing and Civil engineering
(Code and classifcation of the feld of education)

7M071 - Engineering and engineering trades
(Code and classifcation of the direction of training)

0710
(Code in the International Standard Classifcation of Education)

M103 - Mechanics and metalworking
(Code and classifcation of the educational program group)

7M07103 - Technological machinery and equipment
(Code and name of the educational program)

Master
(Level of preparation)

Semey

Educational program

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Master
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Semey 2023

PREFACE

Developed

The educational program 7M07103 - Technological machinery and equipment in the direction of preparation 7M071 - Engineering and engineering trades on the basis of the State Compulsory Standards of Higher and Postgraduate Education approved by the Order of the Ministry of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022 No 2 (as amended by the order) was developed by the Academic Committee dated 20.02.2023 No 66).

Members of the Academic Committee	Full name	Academic degree, academic title, position	Signature
Head of the Academic Committee	Nurymkhan Gulnur	Faculty of Engineering and Technology Deans, PhD	
Educational program manager	Muratbayev Alibek	senior lecturer of the department of technological equipment and mechanical engineering, PhD	
Member of the AC	Zhumadilova Gulmira	head of the department of technological equipment and mechanical engineering, PhD	
Member of the AC	Abdilova Galia	senior lecturer of the department of technological equipment and mechanical engineering, Ph.D.	
Member of the AC	Zhuketai Serikbosyn	LLP Qazaq Astyq Group, regional manager	
Member of the AC	Suychinov Anuarbek	Director of Semey Department of LLP "Kazakh Scientific Research Institute of Food and Processing Industry".	
Member of the AC	Seipilova Madina	Master student of the group MTO-101	
Member of the AC	Rakhimov Bolatbek	Master student of the group MTO-101.2	

Reviewing

Full name of the reviewer	Position, place of work	Signature
Lobasenko Boris	Doctor of Technical Sciences, Professor of Kemerovo State University	

Reviewed

at the meeting of the Quality Assurance Commission of the Faculty of Engineering and Technology
Recommended for approval by the Academic Council of the University
Protocol № 4.6 "10" April 2023
Chairman of the Commission on Quality Assurance Abdilova G.

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

Approved

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

Content

1.Introduction

1.1.General data

This program is designed for graduate OP 7M07103 Technological machines and equipment, faculty of further education of the Department "Technological equipment and machinery" based on the needs of the regional labour market, the requirements of the normative documents of the Ministry of Science and Higher Education of the Republic of Kazakhstan and is a system of documents for organization of educational process

OP 7M07103 Technological machines and equipment is a mandatory part of the main educational program. The program of each discipline (course) is aimed at implementing a single target setting for training a specific specialist and is a basic educational and methodological document.

The introduction of a modular system for organizing the educational process imposes special requirements for the preparation of academic programs, their structure and content. The curriculum of the discipline is developed for each direction of higher professional education with an indication of the corresponding stage (level).

The OP contains a description of the goals and objectives, learning outcomes, qualification characteristics of the graduate, including areas, objects, subjects and types of professional activities, a list of qualifications and positions, the content of the OP with the results of training and competencies of the graduate, the volume of credits mastered in the context of modules.

1.2.Completion criteria

The main criterion for the completion of the educational process for the preparation of masters of the scientific and pedagogical direction is the development of at least 88 credits of theoretical training, including 6 credits of pedagogical practice, 13 credits of research practice, as well as at least 24 credits of research work of a master`s student, including internships and the completion of a master`s thesis, at least 8 credits of the final attestations . A total of 120 credits.

1.3.Typical study duration: 2 years.

2.PASSPORT OF THE EDUCATIONAL PROGRAM

2.1.EP purpose	Preparation of competitive specialists for work in the field of technological machines and equipment of the food and meat and dairy industry, able to quickly adapt to the rapidly changing socio-economic conditions, as well as meeting the needs of the individual in a comprehensive professional and intellectual development
2.2.Map of the training profile within the educational program	
Code and classification of the field of education	7M07 - Engineering, Manufacturing and Civil engineering
Code and classification of the direction of training	7M071 - Engineering and engineering trades
Code in the International Standard Classification of Education	0710
Code and classification of the educational program group	M103 - Mechanics and metalworking
Code and name of the educational program	7M07103 - Technological machinery and equipment
2.3.Qualification characteristics of the graduate	
Degree awarded / qualification	Master of technical Sciences in the educational program 7M07103 -Technological machines and equipment
Name of the profession / list of positions of a specialist	a teacher at a University, a mechanic, a master of food enterprises of various forms of ownership, a technician-technologist of a production laboratory, a researcher in research institutes and Universities, a specialist in standardization and certification centers.
OQF qualification level (industry qualification framework)	7
Area of professional activity	- all industries, including the military-industrial complex; - design and research support for the development of technological processes and production of food production products, design and research organizations; - firms of various forms of ownership, higher and secondary specialized institutions.
Object of professional activity	during scientific and pedagogical training: - universities and other educational institutions, research institutes; - enterprises of various types that provide services for the maintenance and repair of technological machines and equipment.
Types of professional activity	graduates of the master s program 7M07103-Technological machines and equipment can perform the following types of professional activities, with scientific and pedagogical training: - researcher, researcher, teacher in educational organizations.
Graduate Model	Graduate model educational program 7M07103 -Technological machines and equipment 1 Description of EP Educational program 7M07103 - Technological

	machines and equipment was developed by the qualification characteristics of the graduate. It reflects the features of the goals of educational training of masters who have innovative thinking, who own advanced technologies in the field of engineering. The model of the graduate of the educational program 7M07103 - Technological machines and equipment was developed on the basis of the following regulatory documents: 1. Law of the Republic of Kazakhstan "On Education" No. 319-III dated July 27, 2007. 2. Rules for organizing the educational process on credit technology of education Order of the Ministry of Education and Science of the Republic of Kazakhstan dated April 20, 2011 No. 152 3. Model rules for the activities of educational organizations implementing educational programs of higher education, Decree of the Government of the Republic of Kazakhstan dated October 30, 2018 No. 595 4. Strategic plan of "Shakarim Semey University" for 2021-2025. Purpose of the educational program - training of highly qualified personnel in demand in the labor market; – formation of systematized knowledge in the field of engineering; - the formation of key and special competencies of masters with high social and civic responsibility, able to carry out professional activities; - mastering the basics of research and experimental methods of observation and analysis of information processes and phenomena by undergraduates; - the formation of universal and social and personal values in the context of scientific thinking and worldview. 3 Objectives of the educational program - To prepare masters who have a sense of purpose, leadership, the ability to work in a team, carry out scientific research, apply modern methods of scientific and pedagogical direction in the field of information technology, responsible for the final result of their professional activities and the ability for self-improvement and self-development. - Master knowledge in engineering and various research methods. 4 The results of the master`s training in EP 7M07103 - Technological machines and equipment: - demonstrate developmental knowledge and understanding gained at the level of higher professional education, which is the basis or opportunity for original development or application of ideas, often in the context of scientific research; - apply knowledge, understanding and ability to solve problems in new or unfamiliar situations in contexts and within broader (or interdisciplinary) areas related to the field of study; — integrate knowledge, cope with complexity and

	make judgments based on incomplete or limited information, taking into account the ethical and social responsibility for the application of these judgments and knowledge; - clearly and clearly communicate their conclusions and knowledge and their rationale to specialists and non-specialists; - continue learning on your own. 4.1 Mastered competencies expressed in achieved learning outcomes As a result of mastering this master`s program, the graduate should have the following competencies: 1) general cultural competencies (OK): - the ability to improve and develop their general intellectual and general cultural level; - willingness to use knowledge of modern problems of science and education in solving educational and professional problems; - the ability to independently master new research methods, to change the scientific profile of their professional activities; 2) professional competencies: general professional: - the ability to carry out professional and personal self-education, to design a further educational route and professional career; - application of a student-centered approach to ensure the possibility of self-disclosure and self-realization of students; - application of various engineering technologies, creation of favorable conditions for self-education and professional orientation; - implementation of professional, research, production activities in accordance with modern requirements. 4.2 Personal qualities of a graduate The personal qualities of a graduate that must be possessed in order to be a competitive specialist in the field of engineering: - Analytical skills: the ability to conduct a systematic analysis of information; organize information; compare data; abstract information; design result. - Diagnostic skills: the ability to structure the information received; to carry out innovative and combinational processes associated with the ability to predict. - Verbal and non-verbal skills: the ability to build business relationships with colleagues; establish cooperation with partners; formulate professional tasks; be fluent in oral and written language. - Predictive skills: confidence in one`s own actions in accordance with the assessment of everything that happens; manifestation of extraversion and dominance as a condition of purposefulness, management, information modeling, energy mobilization, manifestation of perseverance, activity, ability to withstand the load, perseverance when performing complex tasks.

	- Corrective skills: the ability to carry out introspection, self-correction; determine the trajectory of self-development and self-education; to comprehend their own professional and personal capabilities.

3.Modules and content of the educational program

Sociolinguistic and scientific-pedagogical activity

Foreign language (professional)

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26328 (3011145)
Course	1
Term	1
Credits count	3
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	20hours
Independent work of the student	40hours
Total	90hours
Knowledge control form	Examination

Short description of discipline

Mastery of general cultural, professional and special competencies for the implementation of professional activities, involving teaching free reading of original literature of the relevant branch of knowledge in a foreign language; development of oral communication skills in monological and dialogical form in the specialty; development of written scientific communication skills on topics related to the scientific work of a graduate student, as well as familiarization with the forms and types of international cooperation in the scientific field.

Purpose of studying of the discipline

The purpose of studying the discipline "Foreign language (professional)" in the master`s degree program is the systematic deepening of communicative competence within the framework of international standards of foreign language education on the basis of further development of skills and abilities of active language proficiency in the professional activity of the future master.

Learning Outcomes

ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.

Prerequisites

Bachelor

Postrequisites

Final examination

History and philosophy of science

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26075 (3011144)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline is aimed at studying the culture of scientific thinking, forms analytical capabilities and research skills, provides theoretical and practical knowledge necessary for a future scientist. Explores the historical evolution of the sciences and the philosophical perspectives they form. The origins of modern science, its social and institutional connections are described. General philosophical issues related to thought experiments, confirmation and refutation of theories, the origin and application of quantitative and high-quality research methods are considered.

Purpose of studying of the discipline

the formation of an interdisciplinary worldview among undergraduates, based on a deep understanding of the history and philosophy (theory) of scientific thinking, as part of a universal culture.

Learning Outcomes

ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.

Prerequisites

Bachelor

Postrequisites

Final examination

Tertiary education

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26125 (3011147)

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

Short description of discipline

The course is aimed at studying the main directions, principles and patterns of higher education. During the course of the course, the basic concepts of modern pedagogy, concepts and theories of teaching and upbringing, didactics of higher education will be considered. The master`s student will master the skills of designing the organization of the educational process, techniques of individual and group reflection, will be able to correctly formulate pedagogical goals, apply educational technologies in the educational process. in the process, to design work programs of disciplines.

Purpose of studying of the discipline

The purpose of mastering the discipline is to master the system of knowledge about higher education, its content, structure, principles of educational process management and mastering modern technologies in the field of management and organization of the educational process

Learning Outcomes

ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.

Prerequisites

Bachelor

Postrequisites

Final examination

Psychology of management

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26124 (3011146)
Course	1
Term	1
Credits count	3
Lections	15hours
Practical and seminar classes	15hours
Independent work of a student under the guidance of a teacher	20hours
Independent work of the student	40hours
Total	90hours
Knowledge control form	Examination

Short description of discipline

The content of the course is aimed at mastering the approaches and directions of management psychology, psychological laws of management, features of planning and solving management problems. Students will get acquainted with the psychological methods of resolving conflict situations, master the ways of motivating work, the methods of using effective management styles. Skills will be formed to analyze the psychological causes underlying the decline in the effectiveness of the management process.

Purpose of studying of the discipline

The purpose of the discipline "Psychology of Management" is the formation of scientifically based ideas about the system of mental phenomena, psychological variables of behavior and conscious human activity in modern conditions and allows undergraduates to form skills of applying the acquired psychological knowledge in educational activities

Learning Outcomes

ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.

Prerequisites

Bachelor

Postrequisites

Final examination

Pedagogical practice

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	26137 (3011108)
Course	2
Term	1
Credits count	6
Pedagogical practics	180hours
Total	180hours
Knowledge control form	Total mark on practice

Short description of discipline
Pedagogical practice is a real training of future teachers, conducted in conditions close to the work of the teacher. During the practice, master`s students design a project of educational work with a group of students, perform the concept of classes, reflecting the completed stage of the educational process, as well as demonstrate mastery of advanced technologies of teaching methods.
Purpose of studying of the discipline
Formation of practical skills of teaching and teaching methods in higher educational institutions. Consolidation of theoretical knowledge gained in the process of training and professional development.
Learning Outcomes
ON1 Apply fundamental scientific, pedagogical, managerial, communicative knowledge and skills in professional activities.
Prerequisites
Basic and profile disciplines of the EP
Postrequisites
Final examination

Equipment for processing raw materials of animal and vegetable origin

Methods and devices of measurement and control of parameters of technological machines

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26118 (3011116)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The student at the end of the discipline knows the basic concepts of the theory of measurement, physical quantities and measurement units and general laws and rules of measurement. Can choose methods for determining the errors of technical measurements, identified under the influence of different parameters (fluctuations in external temperature, the impact of different types of fields, etc.). Has skills to use the obtained knowledge for practical purposes.
Purpose of studying of the discipline
To train undergraduates in various measurement methods and instruments, to teach them to determine the errors and accuracy classes of the measuring instruments used, as well as to replace some measuring instruments with others suitable for technical parameters.
Learning Outcomes
ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON4 To characterize the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as to consolidate practical skills, the application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.
Prerequisites
Bachelor
Postrequisites
Final examination

Food rheology

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26074 (3011113)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline studies the basics of engineering rheology of food products, methods and instruments for determining the structural and mechanical properties of food products on the basis of control, regulation and management indicators of raw materials, finished products at the stage of technological processes, forms the knowledge, ability and skills of students in the field of structure of food masses.
Purpose of studying of the discipline

Formation of knowledge in the field of rheology (the science of deformation and flow of real bodies), the study of the basic properties of existing and new products, the establishment of patterns under the influence of various factors during the processing of products, the development of methods for calculating machines and apparatuses and practical recommendations for optimization, control and management of product quality at all stages of production.

Learning Outcomes

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON3 To determine the structural and mechanical characteristics of food products for their use in the calculations of technological equipment.

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Final examination

Machines for machining raw materials of animal origin

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26122 (3011120)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline is aimed at acquiring the knowledge necessary for the formation of a master`s scientific methodological approaches to address professional issues in the study of machine designs for mechanical processing of raw materials of animal origin and to draw up technological schemes and perform the main tasks of mechanization of technological flows of food production, knowledge of the principles of coordination of flow lines.

Purpose of studying of the discipline

Acquisition of knowledge necessary for the formation of scientific and methodological approaches in solving professional issues in the study of machine designs for mechanical processing of raw materials of animal origin.

Learning Outcomes

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON7 Analyze equipment for processing raw materials of animal and vegetable origin.

Prerequisites

Bachelor

Postrequisites

Final examination

The mechanization of the process streams of food production

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26121 (3011119)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline considers the problem of ensuring quality food mankind as a whole, the development of food branches of the national economy n, as well as the theoretical basis of food technology and the impact of various methods of mechanical processing in the transformation of raw materials for basic food humanity in semi-finished and finished products on the quality of the finished product.

Purpose of studying of the discipline

Acquisition of knowledge necessary for the formation of scientific and methodological approaches in solving professional issues in the field of choosing the optimal variant of the technological process and modernization of the flow-mechanized line with an increase in the quality of manufactured products.

Learning Outcomes

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON6 Demonstrate knowledge of structures, the principle of operation, the main technical characteristics of technological machines and

equipment.

Prerequisites

Bachelor

Postrequisites

Final examination

Fundamentals of mathematical and computer modeling of technological processes

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26116 (3011114)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

As a result of mastering the discipline "Fundamentals of mathematical and computer modeling of technological processes", a master`s student forms systematic knowledge in the field of methods of mathematical and computer modeling of technological processes and demonstrates knowledge of the main goals and stages of modeling, as well as varieties of mathematical and computer modeling, selects, builds and analyzes mathematical and computer models in various fields of activity.

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

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON4 To characterize the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as to consolidate practical skills, the application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Final examination

Modern equipment for separation of liquid heterogeneous systems

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26119 (3011117)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

As a result of mastering the discipline, undergraduates will form competencies aimed at acquiring the knowledge necessary to study the classifications and properties of heterogeneous systems, types of basic methods of separation of heterogeneous systems, the basic principles of calculation of separation processes; device the main typical equipment for separating heterogeneous systems by precipitation and filtration, ways to intensify separation processes and improve the efficiency of the device.

Purpose of studying of the discipline

Acquisition of knowledge necessary for the formation of the undergraduate scientific and methodological approaches to solving professional issues in the separation of liquid heterogeneous systems.

Learning Outcomes

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON8 Distinguish between the main types of equipment for pressing food raw materials, the basics of kinetics and dynamics of the technological process of pressing and perform calculations of machines for pressing food raw materials.

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Final examination

Modern machines for grinding food raw materials

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26123 (3011121)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline is aimed at studying the structure of equipment for grinding food raw materials, performing the main tasks and improving the general knowledge of modern machines for grinding. The course deals with the theory of the crushing process, machines for medium and fine crushing, their classification, the structure of industrial meat grinders, the methodology of technological accounting of meat grinders and the device of machines for types of crushing.

Purpose of studying of the discipline

Improvement of knowledge about the structure of machines for grinding food raw materials, performing basic tasks and machines for modern grinding.

Learning Outcomes

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON7 Analyze equipment for processing raw materials of animal and vegetable origin.

Prerequisites

Bachelor

Postrequisites

Final examination

Heat and mass transfer

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26117 (3011115)
Course	1
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The student gets the necessary basic theoretical knowledge of the laws of heat conduction, convective heat transfer, mass transfer, radiation, and also gets acquainted with the features of thermal power plants, applies the basic laws of heat conduction, convective heat transfer, radiation in the thermal calculations of food industry devices. Carries out experiments in laboratory conditions, is able to confirm by engineering calculations compliance of thermal equipment to the conditions of the technological process.

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

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON4 To characterize the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as to consolidate practical skills, the application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Final examination

For non-Newtonian fluids

Discipline cycle	Basic disciplines
Discipline component	Electives
SubjectID	26120 (3011118)
Course	1

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

Short description of discipline
Formation of knowledge on the discipline and the ability to apply them to future specialists in further work activities. Obtaining information about rheology of non- Newtonian liquids, rheological bases of food products research, the influence of rheological properties of food products on technological processes, structural and mechanical characteristics of non-Newtonian liquids, viscous flow, mixing and transportation, basic principles of intensification of processes of formation of food products.

Purpose of studying of the discipline
Formation of undergraduates knowledge of the discipline "For non-Newtonian fluids." Ability to apply the acquired knowledge to the future specialist in further employment.

Learning Outcomes
ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON5 To recognize the classification and the principle of operation of technological equipment for the separation of liquid heterogeneous systems.

Prerequisites
Bachelor

Postrequisites
Final examination

Technological machines and equipment –development prospects

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	26126 (3011109)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is designed to get acquainted with the most promising ways to improve the basic types and types of machines and equipment in the dairy and meat industries. The main emphasis in the study of these types of equipment is based on the commonality of the device of the basic and target mechanisms, constituting in the aggregate actuators and working bodies, which are used in different production purposes.

Purpose of studying of the discipline
The purpose of this course is to acquire the knowledge necessary for the formation of scientific and methodological approaches in solving professional issues in the field of food technology.

Learning Outcomes
ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON4 To characterize the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as to consolidate practical skills, the application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.

Prerequisites
Methods and devices of measurement and control of parameters of technological machines

Postrequisites
Final examination

Methods of processing food raw materials

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26135 (3011127)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours

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

Short description of discipline
The course generalizes knowledge of undergraduates to form optimal scientific and methodological solutions in the consideration of professional tasks in the field of food production. Forms an idea of experimental and theoretical methods of research of various processes, synthesis of these methods, forming similarity theory, composition of types of hydromechanical processes and their general purpose, disperse and heterogeneous systems, technological problems of mixing processes, filtration, sedimentation.

Purpose of studying of the discipline
The purpose of this course is to acquire the knowledge necessary for the formation of scientific and methodological approaches in solving professional issues in the field of food technology.

Learning Outcomes
ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON7 Analyze equipment for processing raw materials of animal and vegetable origin.

Prerequisites
Basic and profile disciplines of the EP The theoretical basis of mechanical processing of food products

Postrequisites
Final examination

Equipment in biotechnology

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26133 (3011125)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The course introduces undergraduates to the main equipment used in food biotechnological industries, with technological assessment of the quality of raw materials and basic calculations of biotechnological industries and prepares undergraduates for research activities related to the creation and operation of machines and devices of food biotechnological industries, as well as teaches the use of knowledge gained as a result of fundamental training for solving problems related to technological equipment.

Purpose of studying of the discipline
The purpose of this course is to acquire the knowledge necessary for the formation of scientific and methodological approaches in solving professional issues in the field of biotechnology equipment.

Learning Outcomes
ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON6 Demonstrate knowledge of structures, the principle of operation, the main technical characteristics of technological machines and equipment.

Prerequisites
Basic and profile disciplines of the EP Bachelor

Postrequisites
Final examination

Food processing by pressing

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26127 (3011110)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
Determination of effective ways to intensify the pressing process in food production, organization and design of research objects.

Description of the pressing process through mixed processes based on a system of mathematical modeling of effective distribution of raw materials. Description of the dependence of intensification of the pressing process by means of ratios of various design and defined parameters.

Purpose of studying of the discipline

Study of theoretical and practical ways to intensify the pressing process using related processes, effective methods of food production in medium and small industries.

Learning Outcomes

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON8 Distinguish between the main types of equipment for pressing food raw materials, the basics of kinetics and dynamics of the technological process of pressing and perform calculations of machines for pressing food raw materials.

Prerequisites

Machines for machining raw materials of animal origin

Postrequisites

Final examination

Modern equipment in grain processing

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26130 (3011122)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline forms the knowledge of technological processes and equipment for processing, storage of grain. The objectives of the discipline includes the formation of graduate students qualitative scientific approach at all stages of grain production, preparation of flour, cereals and mixed fodder, studying the properties of raw materials, teaching its processing in optimal conditions with quality and minimum costs for the production of units of mass of the finished product.

Purpose of studying of the discipline

To reveal the basics of knowledge in the field of technological equipment and machines of the grain processing industry

Learning Outcomes

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON4 To characterize the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as to consolidate practical skills, the application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.

Prerequisites

The mechanization of the process streams of food production

Postrequisites

Final examination

Modern equipment for food packaging

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26128 (3011111)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

Master`s students will acquire theoretical and practical knowledge of technological automatic machines used in the food industry for packaging of food products and study the main types and kinds of technological machines designed for packaging and packaging in related branches of the food industry. Consideration of these types of equipment is based on the study of equipment from the perspective of the generality of the basic and target mechanisms.

Purpose of studying of the discipline

Getting students the knowledge necessary for further study of special disciplines about modern equipment for food packaging, effective use of automated equipment.

Learning Outcomes
ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON4 To characterize the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as to consolidate practical skills, the application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.
Prerequisites
The mechanization of the process streams of food production
Postrequisites
Final examination

Theoretical basis hydromechanical processing of foodstuffs

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26134 (3011126)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline is designed to familiarize undergraduates with the theoretical foundations of hydromechanical processes and obtain practical knowledge and experience in this area. Forms the ability and readiness of students to study hydromechanical processes of food processing. Gives an understanding of the driving force, technological purpose, composition of hydromechanical processes such as mixing, filtration and sedimentation. Explains the conditions, methods and purpose of mixing and blending.
Purpose of studying of the discipline
The purpose of this course is to acquire the knowledge necessary for the formation of scientific and methodological approaches in solving professional issues in the field of food technology.
Learning Outcomes
ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON5 To recognize the classification and the principle of operation of technological equipment for the separation of liquid heterogeneous systems.
Prerequisites
Methods and devices of measurement and control of parameters of technological machines
Postrequisites
Final examination

The theoretical basis of mechanical processing of food products

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26129 (3011112)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
As a result of mastering the discipline, the student will receive the necessary basic theoretical knowledge on the basics of food processing by mechanical processes, as well as get acquainted with the features of mechanical processes in food production and apply the basic laws of force in the mechanical calculations of food production devices.
Purpose of studying of the discipline
The study of the theoretical foundations of the mechanical process of food processing, familiarization of undergraduates with the theoretical foundations of the mechanical process, the acquisition in practice of knowledge and experience in this area.
Learning Outcomes
ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON7 Analyze equipment for processing raw materials of animal and vegetable origin.
Prerequisites
Fundamentals of mathematical and computer modeling of technological processes
Postrequisites

Final examination

Theory and technique of scientific experiment

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26131 (3011123)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The course is aimed at acquainting undergraduates with the theoretical and practical sections of scientific experiment and the formation of practical knowledge and experience in this area. The knowledge acquired in the courses contributes to the ability and readiness to study the theory and technique of scientific practice. Also receive information on theoretical and practical methods of food production processes, similarity theory, types of modeling and their purpose.

Purpose of studying of the discipline

Introduction of doctoral students with the theory and technique of scientific experiment, the acquisition of knowledge and skills in this area in practice.

Learning Outcomes

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON4 To characterize the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as to consolidate practical skills, the application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.
ON9 Apply the theory and technique of scientific experiment; understand the relationship of the theory and technique of scientific experiment with other sciences, the ability to manage technical activities, skills in using the theory and technique of scientific experiment.

Prerequisites

Technological machines and equipment –development prospects

Postrequisites

Final examination

Theory and technique of mixing

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26132 (3011124)
Course	1
Term	2
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

Mastering the discipline contributes to the formation of the student scientific and methodological approaches to solving professional problems related to this area. When studying the discipline the main sections are considered: mixers, media coming to mixing, the purpose and methods of mixing, types of mixers, their choice, the calculation of power per working period, the limiting equation of mixing, grapho-analytical calculation of the mixer.

Purpose of studying of the discipline

Acquiring the knowledge required for the formation of a student scientific-methodological approaches in addressing professional issues in the theory and technique of mixing.

Learning Outcomes

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON5 To recognize the classification and the principle of operation of technological equipment for the separation of liquid heterogeneous systems.

Prerequisites

Machines for machining raw materials of animal origin

Postrequisites

Final examination

Technique and technology of scientific experiments and processing of the obtained data

Research work of a master student, including internship and master`s thesis I

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	26136 (3011141)
Course	1
Term	2
Credits count	11
The research work	330hours
Total	330hours
Knowledge control form	Total mark on practice

Short description of discipline
The research work of a master`s student, including internships and the completion of a master`s thesis, is a real preparation for future teachers, conducted in conditions very close to the high-class work of a teacher. During the practice, undergraduates draw up a project of educational work with a group of students, and also carry out the concept of classes reflecting the completed stage of the educational process based on the search for specialized subjects, as well as demonstrate mastery of advanced technologies of teaching methods.

Purpose of studying of the discipline
collection of the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as consolidation of practical skills, application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.

Learning Outcomes
ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON4 To characterize the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as to consolidate practical skills, the application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.
ON6 Demonstrate knowledge of structures, the principle of operation, the main technical characteristics of technological machines and equipment.

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
Final examination

Equipment for pulse and vibration cutting of food raw materials

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26141 (3011131)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
In the process of studying the course a graduate receives knowledge necessary for the formation of scientific and methodological approaches to the solution of professional problems in the field of membrane processes and technologies in the food industry, as well as for practical application and in the implementation of master`s projects. Reveals the basics of knowledge in the field of technological equipment and machinery.

Purpose of studying of the discipline
General characteristics of dairy equipment. Tanks of the dairy industry. Technological and thermal calculations. The device of pumps of the dairy industry. General information about homogenization. General information about the separation process, classification of separators.

Learning Outcomes
ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON6 Demonstrate knowledge of structures, the principle of operation, the main technical characteristics of technological machines and equipment.

Prerequisites
Modern equipment for food packaging

Postrequisites
Final examination

Fluid dynamics and heat and mass transfer

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26139 (3011129)

Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
This discipline teaches to know the physical properties of liquids and gases, the basic laws of hydrogasodynamics and heat and mass transfer, to apply the acquired knowledge in conducting research, to conduct calculations of processes and phenomena used in the food industry. To master the laws of hydrogasodynamics, the basics of energy conversion, the laws of thermodynamics and heat and mass transfer.

Purpose of studying of the discipline
The purpose 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 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON4 To characterize the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as to consolidate practical skills, the application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.
ON5 To recognize the classification and the principle of operation of technological equipment for the separation of liquid heterogeneous systems.

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
Final examination

Impulse cutting of food raw materials

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26146 (3011136)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline is designed to study food raw materials with the basics of cutting, on various qualitative indicators in the grinding of food raw materials and food products, knowledge of crushing modes, consideration of bone raw materials as an object of mechanical processing, crushing solids, cutting, separation zone study, pulse crushing and the task of studying the mechanical properties of bone using pulse cutting process.

Purpose of studying of the discipline
obtaining by undergraduates the knowledge necessary for the formation of scientific and methodological approaches to solving professional problems in the field of membrane processes of pulsed cutting of food raw materials

Learning Outcomes
ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON6 Demonstrate knowledge of structures, the principle of operation, the main technical characteristics of technological machines and equipment.

Prerequisites
Technological machines and equipment –development prospects

Postrequisites
Final examination

Food packaging machines

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26147 (3011137)
Course	2
Term	1
Credits count	5

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

Short description of discipline
Obtaining theoretical and practical knowledge of technological machines used in the food industry for packaging of food products and studying the main types and kinds of technological machines designed for packaging and packaging in related branches of the food industry. This is about is designed to study the equipment from the standpoint of the commonality of the basic and target mechanisms.

Purpose of studying of the discipline
The purpose of the discipline is to obtain the basics of knowledge in the field of automatic machines, production lines of food production and other devices for processing, feeding, moving and packaging of food products necessary for further study of special disciplines and practical activities in the specialty

Learning Outcomes
ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON6 Demonstrate knowledge of structures, the principle of operation, the main technical characteristics of technological machines and equipment.
ON8 Distinguish between the main types of equipment for pressing food raw materials, the basics of kinetics and dynamics of the technological process of pressing and perform calculations of machines for pressing food raw materials.

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
Final examination

Research work of a master student, including internship and master`s thesis II

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	26149 (3011142)
Course	2
Term	1
Credits count	4
The research work	120hours
Total	120hours
Knowledge control form	Total mark on practice

Short description of discipline
The research work of a master`s student, including internships and the completion of a master`s thesis, is a real preparation for future teachers, conducted in conditions very close to the high-class work of a teacher. During the practice, undergraduates draw up a project of educational work with a group of students, and also carry out the concept of classes reflecting the completed stage of the educational process based on the search for specialized subjects, as well as demonstrate mastery of advanced technologies of teaching methods.

Purpose of studying of the discipline
collection of the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as consolidation of practical skills, application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.

Learning Outcomes
ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON4 To characterize the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as to consolidate practical skills, the application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.
ON6 Demonstrate knowledge of structures, the principle of operation, the main technical characteristics of technological machines and equipment.

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
Final examination

Catering equipment

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26144 (3011134)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours

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

Short description of discipline
The course "Catering equipment" presents the types of technological equipment widely found in catering enterprises, as well as the main processes currently used in the field of catering, types of installations for separation, sorting, separation, cutting, molding, etc., problems and the state of technical improvement of equipment, basic requirements for mechanical equipment and information about general usage issues.

Purpose of studying of the discipline
Obtaining by students of the master`s program, theoretical and practical knowledge about technological machines and other equipment used in public catering.

Learning Outcomes
ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON6 Demonstrate knowledge of structures, the principle of operation, the main technical characteristics of technological machines and equipment.

Prerequisites
Basic and profile disciplines of the EP The mechanization of the process streams of food production

Postrequisites
Final examination

Fundamentals of inventive activity

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26145 (3011135)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline improves the knowledge of students on the formation of scientific and methodological knowledge for solving professional problems arising in the performance of inventive works. Students are familiarized with the basics of protection of individual and industrial intellectual objects under the legislation of the Republic of Kazakhstan, neighboring and far abroad countries, the specificity and structure of patent documents, the structure of the characteristics of inventions, identification data.

Purpose of studying of the discipline
The study of the basics, types, methods and methods of scientific research and inventive activity.

Learning Outcomes
ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON4 To characterize the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as to consolidate practical skills, the application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
Final examination

Bases of simulation of technological processes

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26329 (3011139)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline
The discipline gives undergraduates the basic concepts necessary for solving professional problems arising in the field of modeling processes in food production and fixes the necessary basic knowledge, such as classification of models, construction of a mathematical

model of food production processes, computer model technology, methods of occurrence of random patterns, analysis of modeling results, methods of modeling continuous systems and modeling of production processes.

Purpose of studying of the discipline

Obtaining systematized knowledge in the field of principles of construction and use of mathematical models of production processes and methods of development of modeling algorithms for the implementation of mathematical models.

Learning Outcomes

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON4 To characterize the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as to consolidate practical skills, the application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.

Prerequisites

Basic and profile disciplines of the EP Fundamentals of mathematical and computer modeling of technological processes

Postrequisites

Final examination

Fundamentals of scientific research

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26148 (3011138)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The discipline improves the undergraduates` ideas on the formation of scientific and methodological knowledge to solve professional problems arising in the field of scientific research. Provides information on the study and analysis of food processing processes, planning practice, research, methods of analysis of results and processing of experimental data, results in science and production, the basics of scientific research, physical models and experiments, improvement of mathematical and physical models.

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

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON4 To characterize the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as to consolidate practical skills, the application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.

Prerequisites

Methods and devices of measurement and control of parameters of technological machines

Postrequisites

Final examination

Modern methods of scientific research

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26143 (3011133)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The study of the discipline "Modern methods of scientific research" forms the application of modern methods of research work, consolidates knowledge to develop optimal scientific and methodological solutions when solving problems. The necessary information is given on typical optimization problems, basic approaches to their solution, classification of optimization problems, examples of mathematical models, problems of resource analysis and sequence of work when making optimal decisions.

Purpose of studying of the discipline

collection of the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as

consolidation of practical skills, application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.

Learning Outcomes

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON4 To characterize the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as to consolidate practical skills, the application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.

Prerequisites

Fundamentals of mathematical and computer modeling of technological processes

Postrequisites

Final examination

Technique and technology for separation of liquid heterogeneous systems

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26138 (3011128)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

As a result of mastering the discipline, undergraduates will form competencies aimed at acquiring the knowledge necessary to study the classifications and properties of heterogeneous systems, types of basic methods of separation of heterogeneous systems, the basic principles of calculation of separation processes; device the main typical equipment for separating heterogeneous systems by precipitation and filtration, ways to intensify separation processes and improve the efficiency of the device.

Purpose of studying of the discipline

Modern equipment for the separation of liquid inhomogeneous systems is a technical science, readable for undergraduates, studying the main process patterns in the experimental study of new designs of centrifugal equipment, in particular, experimental separators and centrifuges and the further development of the theory of centrifugal separation.
The widespread use of machines and apparatuses for centrifugal separation in various industries requires a specialist to have deep knowledge in the field of this type of technological equipment. A modern specialist must not only be able to manage certain production processes in accordance with the requirements of technology, but must also ensure their optimal implementation at a high technical level that would meet the latest scientific achievements in this field.

Learning Outcomes

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON5 To recognize the classification and the principle of operation of technological equipment for the separation of liquid heterogeneous systems.

Prerequisites

Basic and profile disciplines of the EP Technological machines and equipment –development prospects

Postrequisites

Final examination

Technical thermodynamics

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26140 (3011130)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

The study of the discipline assumes mastering the methods of thermodynamics for the analysis of physical and chemical phenomena in order to ensure the reliable and effective operation of heat exchange equipment, modern methods of analysis and calculation of thermodynamic processes and cycles of ideal and real gas, equilibrium and phase shifts of thermodynamic systems, equilibrium conditions of isolated homogeneous systems, variable thermodynamic conditions.

Purpose of studying of the discipline

obtaining extensive knowledge about the fundamental laws, patterns and methods of analysis and calculation of thermodynamic processes, developing practical skills in determining the characteristics of heat and mass transfer processes of thermal power devices and apparatuses.

Learning Outcomes

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON4 To characterize the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as to consolidate practical skills, the application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.
ON5 To recognize the classification and the principle of operation of technological equipment for the separation of liquid heterogeneous systems.

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Final examination

Physical methods of processing foods

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	26142 (3011132)
Course	2
Term	1
Credits count	5
Lections	15hours
Practical and seminar classes	30hours
Independent work of a student under the guidance of a teacher	35hours
Independent work of the student	70hours
Total	150hours
Knowledge control form	Examination

Short description of discipline

As a result of mastering the discipline, students form ideas about the physical methods of food processing, as well as about engineering physico-chemical mechanics (engineering rheology). He will also gain deeper knowledge about the physical methods of processing raw matter, electrophysical methods of processing food, their characteristics and features, processing food with infrared rays, high-frequency processing, electroflotation and electrostatic processing.

Purpose of studying of the discipline

Gaining knowledge about physical methods of food processing, an Engineering Physics - Mechanics (engineering rheology).

Learning Outcomes

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON5 To recognize the classification and the principle of operation of technological equipment for the separation of liquid heterogeneous systems.

Prerequisites

Basic and profile disciplines of the EP Machines for machining raw materials of animal origin

Postrequisites

Final examination

Research practice

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	26150 (3011140)
Course	2
Term	2
Credits count	13
Working practice	390hours
Total	390hours
Knowledge control form	Total mark on practice

Short description of discipline

Research practice is a type of research work focused on strengthening the systematization of theoretical and methodological training of a graduate student, the actual mastering of the technology of research work, as well as improving the actual ability to perform scientific and experimental activities in accordance with the requirements for the level of training of a master of technical Sciences. In the course of practice, undergraduates are given the chance to perform experimental studies according to a previously researched plan that takes into account the problems of the master`s thesis.

Purpose of studying of the discipline

Theoretical and experimental work related to the dissertation

Learning Outcomes

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON4 To characterize the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as to consolidate practical skills, the application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.

ON6 Demonstrate knowledge of structures, the principle of operation, the main technical characteristics of technological machines and equipment.

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Final examination

Research work of a master student, including internship and master`s project III

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	26151 (3011143)
Course	2
Term	2
Credits count	9
Working practice	270hours
Total	270hours
Knowledge control form	Total mark on practice

Short description of discipline

The research work of a master`s student, including internships and the completion of a master`s thesis, is a real preparation for future teachers, conducted in conditions very close to the high-class work of a teacher. During the practice, undergraduates draw up a project of educational work with a group of students, and also carry out the concept of classes reflecting the completed stage of the educational process based on the search for specialized subjects, as well as demonstrate mastery of advanced technologies of teaching methods.

Purpose of studying of the discipline

collection of the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as consolidation of practical skills, application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.

Learning Outcomes

ON2 Choose the necessary research methods, modify existing ones and develop new methods based on the tasks of a particular study.
ON4 To characterize the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as to consolidate practical skills, the application of modern methods of scientific research, processing and interpretation of experimental data in dissertation research.
ON6 Demonstrate knowledge of structures, the principle of operation, the main technical characteristics of technological machines and equipment.

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Final examination

Final assessment

Master`s dissertation

Credits count	8

4.Summary table on the scope of the educational program
«7M07103 - Technological machinery and equipment»

Name of discipline	Cycle/ Component	Term	Number of credits	Total hours	Lec	SPL	LC	IWST	IWS	Knowledge control form
Sociolinguistic and scientific-pedagogical activity										
Foreign language (professional)	BS/US	1	3	90		30		20	40	Examination
History and philosophy of science	BS/US	1	5	150	15	30		35	70	Examination
Tertiary education	BS/US	1	3	90	15	15		20	40	Examination
Psychology of management	BS/US	1	3	90	15	15		20	40	Examination
Pedagogical practice	BS/US	3	6	180						Total mark on practice
Equipment for processing raw materials of animal and vegetable origin										
Methods and devices of measurement and control of parameters of technological machines	BS/CCh	1	5	150	15	30		35	70	Examination
Food rheology	BS/CCh	1	5	150	15	30		35	70	Examination
Machines for machining raw materials of animal origin	BS/CCh	1	5	150	15	30		35	70	Examination
The mechanization of the process streams of food production	BS/CCh	1	5	150	15	30		35	70	Examination
Fundamentals of mathematical and computer modeling of technological processes	BS/CCh	1	5	150	15	30		35	70	Examination
Modern equipment for separation of liquid heterogeneous systems	BS/CCh	1	5	150	15	30		35	70	Examination
Modern machines for grinding food raw materials	BS/CCh	1	5	150	15	30		35	70	Examination
Heat and mass transfer	BS/CCh	1	5	150	15	30		35	70	Examination
For non-Newtonian fluids	BS/CCh	1	5	150	15	30		35	70	Examination
Technological machines and equipment –development prospects	AS/US	2	5	150	15	30		35	70	Examination
Methods of processing food raw materials	AS/CCh	2	5	150	15	30		35	70	Examination
Equipment in biotechnology	AS/CCh	2	5	150	15	30		35	70	Examination
Food processing by pressing	AS/CCh	2	5	150	15	30		35	70	Examination
Modern equipment in grain processing	AS/CCh	2	5	150	15	30		35	70	Examination
Modern equipment for food packaging	AS/CCh	2	5	150	15	30		35	70	Examination
Theoretical basis hydromechanical processing of foodstuffs	AS/CCh	2	5	150	15	30		35	70	Examination
The theoretical basis of mechanical processing of food products	AS/CCh	2	5	150	15	30		35	70	Examination
Theory and technique of scientific experiment	AS/CCh	2	5	150	15	30		35	70	Examination
Theory and technique of mixing	AS/CCh	2	5	150	15	30		35	70	Examination
Technique and technology of scientific experiments and processing of the obtained data										

Research work of a master student, including internship and master`s thesis I	AS/US	2	11	330						Total mark on practice
Equipment for pulse and vibration cutting of food raw materials	AS/CCh	3	5	150	15	30		35	70	Examination
Fluid dynamics and heat and mass transfer	AS/CCh	3	5	150	15	30		35	70	Examination
Impulse cutting of food raw materials	AS/CCh	3	5	150	15	30		35	70	Examination
Food packaging machines	AS/CCh	3	5	150	15	30		35	70	Examination
Research work of a master student, including internship and master`s thesis II	AS/US	3	4	120						Total mark on practice
Catering equipment	AS/CCh	3	5	150	15	30		35	70	Examination
Fundamentals of inventive activity	AS/CCh	3	5	150	15	30		35	70	Examination
Bases of simulation of technological processes	AS/CCh	3	5	150	15	30		35	70	Examination
Fundamentals of scientific research	AS/CCh	3	5	150	15	30		35	70	Examination
Modern methods of scientific research	AS/CCh	3	5	150	15	30		35	70	Examination
Technique and technology for separation of liquid heterogeneous systems	AS/CCh	3	5	150	15	30		35	70	Examination
Technical thermodynamics	AS/CCh	3	5	150	15	30		35	70	Examination
Physical methods of processing foods	AS/CCh	3	5	150	15	30		35	70	Examination
Research practice	AS/US	4	13	390						Total mark on practice
Research work of a master student, including internship and master`s project III	AS/US	4	9	270						Total mark on practice
Final assessment										
Master`s dissertation		4	8	240						