NJSC SHAKARIM UNIVERSITY OF SEMEY

EDUCATIONAL PROGRAM

8D07 - Engineering, Manufacturing and Civil engineering
(Code and classification of the field of education)

8D071 - Engineering and engineering trades
(Code and classification of the direction of training)

0710
(Code in the International Standard Classification of Education)

D103 - Engineering and Manufacturing Industries
(Code and classification of the educational program group)

8D07101 - Technological machinery and equipment
(Code and name of the educational program)

Doctor of philosophy (PhD)
(Level of preparation)

Semey

Educational program

8D07 - Engineering, Manufacturing and Civil engineering
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Doctor of philosophy (PhD)
(Level of preparation)

Semey 2023

PREFACE

Developed

The educational program 8D07101 - Technological machinery and equipment in the direction of preparation 8D071 - 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	Nyrymkhan Gulnur	Dean of the Faculty of Engineering and Technology, Ph.D.	
Educational program manager	Abdilova Galiya	senior lecturer of the Department "Technological Equipment and Mechanical Engineering" Candidate of Technical Sciences	
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Member of the AC	Zhumadilova Gulmira	Head of the Department "Technological Equipment and Mechanical Engineering" PhD	
Member of the AC	Suichinov Anuarbek	Director of the Semey branch of Kazakh Research Institute of Processing and Food Industry LLP, PhD	
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Member of the AC	Bayadilova Asyl	Doctoral student of the Department "Technological Equipment and Mechanical Engineering"	
Member of the AC	Tashybaeva Marzhan	Doctoral student of the Department "Technological Equipment and Mechanical Engineering"	

Reviewing

Full name of the reviewer	Position, place of work	Signature
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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.

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1.Introduction

1.1.General data

This program was developed for the doctoral program OP 8D07101 Technological machines and equipment, Faculty of Further Education, Department of Technological Equipment and Mechanical Engineering, taking into account the needs of the regional labor market, the requirements of regulatory documents of the Ministry of Science and Higher Education of the Republic of Kazakhstan and is a system of documents for the organization of the educational process. The educational program 8D07101 Technological machines and equipment for the preparation of a Doctor of Philosophy (PhD) has a scientific and pedagogical orientation and assumes fundamental educational, methodological and research training and in-depth study of disciplines in the relevant fields of sciences for the system of higher and postgraduate education and the scientific sphere.

The introduction of a modular system for the organization of the educational process imposes special requirements on the preparation of curricula of academic disciplines, their structure and content. The curriculum of the discipline is being developed

1.2.Completion criteria

The main criterion for the completion of the educational process for the preparation of specialty 8D07101 "Technological machines and equipment" is the development of students at least 45 credits of theoretical training, as well as at least 10 credits of pedagogical practice, 10 credits of research practice, 123 credits of research work, at least 12 credits for writing and defending a doctoral dissertation. A total of 180 credits.

1.3.Typical study duration: 3 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	8D07 - Engineering, Manufacturing and Civil engineering
Code and classification of the direction of training	8D071 - Engineering and engineering trades
Code in the International Standard Classification of Education	0710
Code and classification of the educational program group	D103 - Engineering and Manufacturing Industries
Code and name of the educational program	8D07101 - Technological machinery and equipment
2.3.Qualification characteristics of the graduate	
Degree awarded / qualification	Doctor of Philosophy PhD in the educational program 8D07101 Technological machines and equipment
Name of the profession / list of positions of a specialist	- teacher at Universities and colleges; -head of the laboratory of food enterprises of various forms of ownership; - research associate; - researcher in research institutes and Universities; - specialist in the centers of standardization and certification.
OQF qualification level (industry qualification framework)	8
Area of professional activity	all branches of industry, including the military-industrial complex, as well as design and research support for the development of technological processes and production of food products, design and research organizations, as well as 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, enterprises that certify food products.
Types of professional activity	Graduates of the doctoral program OP 8D07101 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	1 Description of the OP The educational program 8D07101 – "Technological machines and equipment" was developed by the qualification characteristics of the graduate. It reflects the features of the objectives of the educational training of doctoral students with innovative thinking, owning advanced technologies in the field of

	engineering. Graduate model educational program 8D07101 – "Technological machines and equipment" 1. The Law of the Republic of Kazakhstan "On Education" No. 319-III dated July 27, 2007. 2. State Higher and Postgraduate Education No. 2 dated 20.07.2022 3. Rules for the organization of 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 4. Standard Rules for the activities of educational organizations implementing educational programs of higher education, Resolution No. 595 of the Government of the Republic of Kazakhstan dated October 30, 2018 5. Strategic plan of the NAO "Shakarim Semey University" for 2021-2025. 2 The 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; – formation of key and special competencies of a Doctor of Philosophy (PhD) with high social and civic responsibility, able to carry out professional activities; mastering by doctoral students of the basics of research and experimental methods of observation and analysis of information processes and phenomena; formation of universal and socio-personal values in the context of scientific thinking and worldview. 3 Objectives of the educational program - To prepare a Doctor of philosophy (PhD) with dedication, 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 to self-improvement and self-development. - Master knowledge in engineering and various research methods. 4 Results of the Doctor of Philosophy (PhD) training on OP 8D07101 - "Technological machines and equipment": - demonstrate the developing knowledge and understanding gained at the level of higher professional education, which are the basis or opportunity for the original development or application of ideas, often in the context of scientific research; - apply knowledge, understanding and the ability to solve problems in new or unfamiliar situations in contexts and within broader (or interdisciplinary) areas related to the field being studied; - integrate knowledge, cope with difficulties and make judgments based on incomplete or limited information, taking into account ethical and social

	responsibility for the application of these judgments and knowledge; - clearly and clearly communicate their conclusions and knowledge and their justification to specialists and non-specialists; - continue training independently. 4.1 Acquired competencies expressed in the achieved learning outcomes As a result of mastering this OP of doctoral studies , the graduate must 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 tasks; - 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; - the use of a personality-oriented 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 the graduate The personal qualities of a graduate that must be possessed in order to be a competitively capable specialist in the field of engineering: - Analytical skills: the ability to conduct a systematic analysis of information; systematize information; compare data; abstract information; design the result. - Diagnostic skills: the ability to structure the information received; to implement innovative and combinational processes related to the ability to predict. - Verbal and non-verbal skills: the ability to build business relationships with colleagues; establish cooperation with partners; formulate professional tasks; master oral and written speech. - Predictive skills: confidence in one`s own actions in accordance with the assessment of everything that is happening; manifestation of extroversion and dominance as a condition of purposefulness, management, information modeling, energy mobilization, perseverance, activity, ability to withstand the load, perseverance when performing complex tasks. - Correctional skills: the ability to carry out self-analysis, self-correction; to determine the trajectories

	of self-development and self-education; to comprehend their own professional and personal capabilities.

3.Modules and content of the educational program

Modern aspects of the development of science and practice in the field of technological machines and equipment

Academic writing

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	28190 (3010998)
Course	1
Term	1
Credits count	5
Lections	30hours
Practical and seminar classes	15hours
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

Academic writing is a procedural formalization of the process of scientific communication. As a result of mastering this discipline, the skill of constructing an academic text is formed based on the idea of its basic structure, goals, genre and stylistic features. The study of the discipline is aimed at improving the level of academic literacy, mastering Kazakh and international standards for the creation of academic texts, developing skills in writing scientific papers of a problematic direction.

Purpose of studying of the discipline

The purpose of the discipline is to develop students` relevant competencies aimed at forming readiness and ability to implement their own research projects and present their results in writing in accordance with the norms of the international academic community, including writing a graduation paper. Improving competence in the field of academic writing: the ability to organize your own ideas correctly, clearly substantiate them and convincingly express them; knowledge about the technologies of structuring academic text; reflection skills: finding errors and analyzing your own text.

Learning Outcomes

ON2 Broadcast educational information, teach yourself to acquire knowledge.
ON3 Demonstrate basic and general knowledge about the organization of a holistic technological process, the ability to manage technical activities, skills in choosing methods, forms and technologies of food production.
ON10 To carry out methodological support of the educational process.
ON12 To interact with the professional community and with all stakeholders of the education system.

Prerequisites

Masters degree course

Postrequisites

Basic and profile disciplines of the EP

Research methods

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	32286 (3010999)
Course	1
Term	1
Credits count	5
Lections	30hours
Practical and seminar classes	15hours
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 an idea of the methods of scientific research as a special way of knowing reality and a means of forming technical knowledge. The course is aimed not only at mastering theoretical knowledge, but also at the ability to apply new research paradigms in practice, introduce them into the research process, reveal and study historical facts, and adapt them to research work

Purpose of studying of the discipline

The discipline gives an idea of the methods of scientific research as a special way of knowing reality and a means of forming technical knowledge. The course is aimed not only at mastering theoretical knowledge, but also at the ability to apply new research paradigms in practice, introduce them into the research process, reveal and study historical facts, and adapt them to research work.

Learning Outcomes

ON6 Manage the organization of experiments and processing of the received data.
ON7 Plan, simulate preparation and correctly conducts a scientific experiment. Performs processing of the obtained experimental data.
ON9 Apply the theory and technique of engineering experiment; understand the relationship of the theory and technique of engineering

experiment with other sciences, the ability to manage technical activities, skills in using the theory and technique of engineering experiment.

Prerequisites

Masters degree course

Postrequisites

Basic and profile disciplines of the EP Research practice

Scientific-theoretical bases of heat and mass transfer processes

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	33245 (3010988)
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

Formation at the student``s ability and willingness to use scientific and theoretical foundations of heat and mass transfer processes

Purpose of studying of the discipline

Familiarization of doctoral students with the scientific and theoretical foundations of thermal and mass transfer processes, obtaining knowledge, skills and abilities in this field in practice. Formation of the student`s ability and readiness to apply the scientific and theoretical foundations of thermal and mass transfer processes.

Learning Outcomes

ON3 Demonstrate basic and general knowledge about the organization of a holistic technological process, the ability to manage technical activities, skills in choosing methods, forms and technologies of food production.
ON4 Introduce students to the system of social values.
ON8 Demonstrate basic and general knowledge about the organization of an integral technological process, the ability to manage technical activities, skills in choosing methods and forms of hydromechanical processes for food processing.
ON10 To carry out methodological support of the educational process.

Prerequisites

Masters degree course

Postrequisites

Basic and profile disciplines of the EP

The latest achievements in the field of technological equipment of meat and dairy industry

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	33243 (3010986)
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

Purpose of studying of the discipline

Familiarization of doctoral students with modern aspects of the development of science and practice in the field of technological machines and equipment, obtaining knowledge, skills and abilities in this field in practice. Formation of the student`s ability and readiness for the development of science and practice in the field of technological machines and equipment.

Learning Outcomes

ON3 Demonstrate basic and general knowledge about the organization of a holistic technological process, the ability to manage technical activities, skills in choosing methods, forms and technologies of food production.
ON5 Check the level of consolidation of theoretical knowledge gained in the process of training and professional development.
ON10 To carry out methodological support of the educational process.
ON11 To study the level of assimilation of educational content by students, to explore the educational environment.

Prerequisites

Masters degree course

Postrequisites

Basic and profile disciplines of the EP Research work of the doctoral student, including internship and doctoral dissertation II

Modern aspects of science and practice in the field of technological machinery and equipment

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	33244 (3010987)
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
Introduction doctoral modern aspects of science and practice in the field of technological machinery and equipment, the acquisition of knowledge and skills in this area in practice

Purpose of studying of the discipline
Familiarization of doctoral students with modern aspects of the development of science and practice in the field of technological machines and equipment, obtaining knowledge, skills and abilities in this field in practice. Formation of the student`s ability and readiness for the development of science and practice in the field of technological machines and equipment.

Learning Outcomes
ON1 Evaluate modern aspects of the development of science and practice in the field of technological machines and equipment.
ON2 Broadcast educational information, teach yourself to acquire knowledge.
ON5 Check the level of consolidation of theoretical knowledge gained in the process of training and professional development.
ON10 To carry out methodological support of the educational process.

Prerequisites
Masters degree course

Postrequisites
Basic and profile disciplines of the EP

Pedagogical practice

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	33250 (3010997)
Course	2
Term	1
Credits count	10
Pedagogical practics	300hours
Total	300hours
Knowledge control form	Total mark on practice

Short description of discipline
The pedagogical practice of doctoral students is a real preparation of future teachers, conducted in conditions very close to the high-class work of a teacher. During the practice, doctoral students 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
To form practical skills of teaching and learning methods in universities. Consolidate the theoretical knowledge gained in the process of training and professional development.

Learning Outcomes
ON2 Broadcast educational information, teach yourself to acquire knowledge.
ON4 Introduce students to the system of social values.
ON5 Check the level of consolidation of theoretical knowledge gained in the process of training and professional development.

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
Research work of the doctoral student, including internship and doctoral dissertation VI

Organization of experiments and processing of the obtained data

Membrane processes and technologies in the food industry

Discipline cycle	Basic disciplines
Discipline component	University component
SubjectID	28191 (3010989)
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 use of membrane processes and technology in the food industry allows a doctoral student to create highly efficient and low-waste technologies for processing solutions of inorganic and organic compounds, including liquid food products. This course contributes to improving the quality of products, their biological value and full processing and use when using membrane processes in the food industry.

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 membrane processes and technologies in the food industry.

Learning Outcomes
ON2 Broadcast educational information, teach yourself to acquire knowledge.
ON3 Demonstrate basic and general knowledge about the organization of a holistic technological process, the ability to manage technical activities, skills in choosing methods, forms and technologies of food production.
ON11 To study the level of assimilation of educational content by students, to explore the educational environment.

Prerequisites
Masters degree course

Postrequisites
Basic and profile disciplines of the EP

Research work of the doctoral student, including internship and doctoral dissertation I

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	33242 (3010991)
Course	1
Term	1
Credits count	15
Working practice	450hours
Total	450hours
Knowledge control form	Total mark on practice

Short description of discipline
The research work of a doctoral student should correspond to the main problems of the specialty in which the doctoral dissertation is being defended. Be relevant, contain scientific novelty and practical significance. Be based on modern theoretical, methodological and technological achievements of science and practice. Based on modern methods of data processing and interpretation using computer technology. Be carried out using modern methods of scientific research. Contain research (methodological, practical) sections on the main protected provisions.

Purpose of studying of the discipline
The purpose of the research work is to prepare a doctoral student who owns the methodology of scientific knowledge and is able to apply scientific methods in the study of problems of modern science and technology.

Learning Outcomes
ON7 Plan, simulate preparation and correctly conducts a scientific experiment. Performs processing of the obtained experimental data.
ON11 To study the level of assimilation of educational content by students, to explore the educational environment.

Prerequisites
Masters degree course

Postrequisites
Basic and profile disciplines of the EP Research practice

Mathematical modeling of machining processes

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	33248 (3014282)
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 the basis for in-depth study and development of special mathematical methods of mathematical modeling of the machining process, as well as qualified solutions to process control problems, selection and adoption of technological solutions, the construction of intelligent decision-making systems, the study of technological processing capabilities. Familiarization of doctoral students with mathematical modeling of the machining process, obtaining knowledge and experience in this field in practice.
Purpose of studying of the discipline
Familiarization of doctoral students with mathematical modeling of machining processes in the field of technological machines and equipment, obtaining knowledge, skills and abilities in this field in practice.
Learning Outcomes
ON2 Broadcast educational information, teach yourself to acquire knowledge.
ON3 Demonstrate basic and general knowledge about the organization of a holistic technological process, the ability to manage technical activities, skills in choosing methods, forms and technologies of food production.
ON5 Check the level of consolidation of theoretical knowledge gained in the process of training and professional development.
ON7 Plan, simulate preparation and correctly conducts a scientific experiment. Performs processing of the obtained experimental data.
Prerequisites
Masters degree course
Postrequisites
Basic and profile disciplines of the EP

Research work of the doctoral student, including internship and doctoral dissertation II

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	33246 (3010992)
Course	1
Term	2
Credits count	20
Working practice	600hours
Total	600hours
Knowledge control form	Total mark on practice

Short description of discipline
The research work of a doctoral student should correspond to the main problems of the specialty in which the doctoral dissertation is being defended. Be relevant, contain scientific novelty and practical significance. Be based on modern theoretical, methodological and technological achievements of science and practice. Based on modern methods of data processing and interpretation using computer technology. Be carried out using modern methods of scientific research. Contain research (methodological, practical) sections on the main protected provisions.
Purpose of studying of the discipline
The purpose of the research work is to prepare a doctoral student who owns the methodology of scientific knowledge and is able to apply scientific methods in the study of problems of modern science and technology.
Learning Outcomes
ON7 Plan, simulate preparation and correctly conducts a scientific experiment. Performs processing of the obtained experimental data.
ON8 Demonstrate basic and general knowledge about the organization of an integral technological process, the ability to manage technical activities, skills in choosing methods and forms of hydromechanical processes for food processing.
ON11 To study the level of assimilation of educational content by students, to explore the educational environment.
Prerequisites
Masters degree course
Postrequisites
Basic and profile disciplines of the EP

Rheological bases of visco-plastic food

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	33247 (3014281)
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 subject of the discipline is the technological processes of the food industry associated with mechanical action on the processed product. The choice of technological equipment, the determination of its operating modes is determined by the physico-mechanical, rheological properties of food masses, semi-finished products and finished products. Formation of necessary theoretical and practical skills among students, sufficient for their further activities and allowing them to independently master new knowledge based on scientific achievements in the relevant industry.

Purpose of studying of the discipline
Familiarization of doctoral students with the rheological foundations of visco-plastic food products in the field of technological machines and equipment, obtaining knowledge, skills and abilities in this field in practice.
Learning Outcomes
ON2 Broadcast educational information, teach yourself to acquire knowledge.
ON3 Demonstrate basic and general knowledge about the organization of a holistic technological process, the ability to manage technical activities, skills in choosing methods, forms and technologies of food production.
ON8 Demonstrate basic and general knowledge about the organization of an integral technological process, the ability to manage technical activities, skills in choosing methods and forms of hydromechanical processes for food processing.
Prerequisites
Masters degree course
Postrequisites
Basic and profile disciplines of the EP

Theory and technique of engineering experiment

Discipline cycle	Profiling discipline
Discipline component	Electives
SubjectID	33249 (3014283)
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 subject of this course is the methods of the best organization of the experiment, processing and interpretation of its results.
Currently, the main attention should be paid to the general principles of experimental work and the optimal organization of the experiment. Mastering the main issues of the discipline will ensure the formation of students with the necessary theoretical and practical skills sufficient for their further activities and allowing them to independently master new knowledge based on scientific achievements in the relevant industry.
Purpose of studying of the discipline
Familiarization of doctoral students with the theory and technique of scientific practice, obtaining knowledge and experience in this field in practice. Increasing the ability and readiness to study the theory and techniques of scientific practice.
Learning Outcomes
ON6 Manage the organization of experiments and processing of the received data.
ON7 Plan, simulate preparation and correctly conducts a scientific experiment. Performs processing of the obtained experimental data.
ON9 Apply the theory and technique of engineering experiment; understand the relationship of the theory and technique of engineering experiment with other sciences, the ability to manage technical activities, skills in using the theory and technique of engineering experiment.
Prerequisites
Masters degree course
Postrequisites
Basic and profile disciplines of the EP

Research work of the doctoral student, including internship and doctoral dissertation III

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	33251 (3010993)
Course	2
Term	1
Credits count	20
Working practice	600hours
Total	600hours
Knowledge control form	Total mark on practice

Short description of discipline
The research work of a doctoral student should correspond to the main problems of the specialty in which the doctoral dissertation is being defended. Be relevant, contain scientific novelty and practical significance. Be based on modern theoretical, methodological and technological achievements of science and practice. Based on modern methods of data processing and interpretation using computer technology. Be carried out using modern methods of scientific research. Contain research (methodological, practical) sections on the main protected provisions.
Purpose of studying of the discipline
The purpose of the research work is to prepare a doctoral student who owns the methodology of scientific knowledge and is able to apply scientific methods in the study of problems of modern science and technology.
Learning Outcomes

ON2 Broadcast educational information, teach yourself to acquire knowledge.
ON7 Plan, simulate preparation and correctly conducts a scientific experiment. Performs processing of the obtained experimental data.

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Research practice

Research work of the doctoral student, including internship and doctoral dissertation IV

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	33252 (3010994)
Course	2
Term	2
Credits count	30
Working practice	900hours
Total	900hours
Knowledge control form	Total mark on practice

Short description of discipline

The research work of a doctoral student should correspond to the main problems of the specialty in which the doctoral dissertation is being defended. Be relevant, contain scientific novelty and practical significance. Be based on modern theoretical, methodological and technological achievements of science and practice. Based on modern methods of data processing and interpretation using computer technology. Be carried out using modern methods of scientific research. Contain research (methodological, practical) sections on the main protected provisions.

Purpose of studying of the discipline

The purpose of the research work is to prepare a doctoral student who owns the methodology of scientific knowledge and is able to apply scientific methods in the study of problems of modern science and technology.

Learning Outcomes

ON7 Plan, simulate preparation and correctly conducts a scientific experiment. Performs processing of the obtained experimental data.
ON11 To study the level of assimilation of educational content by students, to explore the educational environment.

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Research practice

Research practice

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	33253 (3010990)
Course	3
Term	1
Credits count	10
Working practice	300hours
Total	300hours
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 doctoral 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 PhD doctor. During the practice, doctoral students are given the chance to perform experimental studies according to a previously researched plan that takes into account the problems of the doctoral dissertation.

Purpose of studying of the discipline

To analyze 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.

Learning Outcomes

ON6 Manage the organization of experiments and processing of the received data.
ON7 Plan, simulate preparation and correctly conducts a scientific experiment. Performs processing of the obtained experimental data.
ON9 Apply the theory and technique of engineering experiment; understand the relationship of the theory and technique of engineering experiment with other sciences, the ability to manage technical activities, skills in using the theory and technique of engineering experiment.

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Research work of the doctoral student, including internship and doctoral dissertation V Research work of the doctoral student, including internship and doctoral dissertation VI

Research work of the doctoral student, including internship and doctoral dissertation V

Discipline cycle	Profiling discipline

Discipline component	University component
SubjectID	33254 (3010995)
Course	3
Term	1
Credits count	20
Working practice	600hours
Total	600hours
Knowledge control form	Total mark on practice

Short description of discipline
The research work of a doctoral student should correspond to the main problems of the specialty in which the doctoral dissertation is being defended. Be relevant, contain scientific novelty and practical significance. Be based on modern theoretical, methodological and technological achievements of science and practice. Based on modern methods of data processing and interpretation using computer technology. Be carried out using modern methods of scientific research. Contain research (methodological, practical) sections on the main protected provisions.

Purpose of studying of the discipline
The purpose of the research work is to prepare a doctoral student who owns the methodology of scientific knowledge and is able to apply scientific methods in the study of problems of modern science and technology.

Learning Outcomes
ON2 Broadcast educational information, teach yourself to acquire knowledge.
ON6 Manage the organization of experiments and processing of the received data.
ON7 Plan, simulate preparation and correctly conducts a scientific experiment. Performs processing of the obtained experimental data.

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
Research practice

Research work of the doctoral student, including internship and doctoral dissertation VI

Discipline cycle	Profiling discipline
Discipline component	University component
SubjectID	33255 (3010996)
Course	3
Term	2
Credits count	18
Working practice	540hours
Total	540hours
Knowledge control form	Total mark on practice

Short description of discipline
The research work of a doctoral student should correspond to the main problems of the specialty in which the doctoral dissertation is being defended. Be relevant, contain scientific novelty and practical significance. Be based on modern theoretical, methodological and technological achievements of science and practice. Based on modern methods of data processing and interpretation using computer technology. Be carried out using modern methods of scientific research. Contain research (methodological, practical) sections on the main protected provisions.

Purpose of studying of the discipline
The purpose of the research work is to prepare a doctoral student who owns the methodology of scientific knowledge and is able to apply scientific methods in the study of problems of modern science and technology.

Learning Outcomes
ON6 Manage the organization of experiments and processing of the received data.
ON7 Plan, simulate preparation and correctly conducts a scientific experiment. Performs processing of the obtained experimental data.
ON11 To study the level of assimilation of educational content by students, to explore the educational environment.

Prerequisites
Basic and profile disciplines of the EP

Postrequisites
Research practice

Final assessment

Credits count	12

4.Summary table on the scope of the educational program
«8D07101 - Technological machinery and equipment»

Name of discipline	Cycle/ Component	Term	Number of credits	Total hours	Lec	SPL	LC	IWST	IWS	Knowledge control form
Modern aspects of the development of science and practice in the field of technological machines and equipment										
Academic writing	BS/US	1	5	150	30	15		35	70	Examination
Research methods	BS/US	1	5	150	30	15		35	70	Examination
Scientific-theoretical bases of heat and mass transfer processes	AS/CCh	2	5	150	15	30		35	70	Examination
The latest achievements in the field of technological equipment of meat and dairy industry	AS/CCh	2	5	150	15	30		35	70	Examination
Modern aspects of science and practice in the field of technological machinery and equipment	AS/CCh	2	5	150	15	30		35	70	Examination
Pedagogical practice	BS/US	3	10	300						Total mark on practice
Organization of experiments and processing of the obtained data										
Membrane processes and technologies in the food industry	BS/US	1	5	150	15	30		35	70	Examination
Research work of the doctoral student, including internship and doctoral dissertation I	AS/US	1	15	450						Total mark on practice
Mathematical modeling of machining processes	AS/CCh	2	5	150	15	30		35	70	Examination
Research work of the doctoral student, including internship and doctoral dissertation II	AS/US	2	20	600						Total mark on practice
Rheological bases of visco-plastic food	AS/CCh	2	5	150	15	30		35	70	Examination
Theory and technique of engineering experiment	AS/CCh	2	5	150	15	30		35	70	Examination
Research work of the doctoral student, including internship and doctoral dissertation III	AS/US	3	20	600						Total mark on practice
Research work of the doctoral student, including internship and doctoral dissertation IV	AS/US	4	30	900						Total mark on practice
Research practice	AS/US	5	10	300						Total mark on practice
Research work of the doctoral student, including internship and doctoral dissertation V	AS/US	5	20	600						Total mark on practice
Research work of the doctoral student, including internship and doctoral dissertation VI	AS/US	6	18	540						Total mark on practice
Final assessment										
		6	12	360						