The list of academic disciplines of the university component

8D07 - Engineering, manufacturing and construction industries
(Code and classification of the field of education)

8D071 - Engineering and Engineering affairs
(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)

set of 2024

Semey 2024

Developed
By the Academic Committee of the EP
The head of the AC Nurymkhan G.
EP Manager Kabulov B.

Reviewed
at a meeting of the Academic Quality Committee of the Faculty of Engineering and Technology
Protocol No. 3 dated 15.01.2024
at a meeting of the Academic Quality Committee of the Research School of Food Engineering
Recommended for approval by the Academic Council of the University
Protocol No. 1 , dated 06.06.2024

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

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

Statistics and experimental design using R

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

Short description of discipline
The course provides an in-depth study of statistical methods and principles of experimental design using the R programming language. The course examines real-world research examples, starting with descriptive statistics and ending with complex experimental designs. The course will prepare students to independently perform data analysis, design experiments and interpret the results.

Purpose of studying of the discipline
Doctoral students tudents will master modern statistical methods of data analysis and the principles of experimental design using the R programming language, which will allow them to effectively apply this knowledge in scientific research.

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.

Learning outcomes by discipline
Knowledge of basic statistical concepts and methods. The ability to use R software for statistical data analysis. Skills of independent design of experiments and interpretation of their results. The ability to use the results obtained in real scientific and applied research. Негізгі статистикалық ұғымдар мен әдістерді білу.

Prerequisites
Masters degree course

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

Membrane processes and technologies in the food industry

Discipline cycle	Basic disciplines
Course	1
Credits count	5
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.

Learning outcomes by discipline
- Demonstrates 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

Research methods

Discipline cycle	Basic disciplines
Course	1
Credits count	5
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.

Learning outcomes by discipline

- Demonstrates basic and general educational knowledge about the organization of a holistic technological process, the ability to manage technical activities, the skills of using scientific research methods.

Prerequisites

Masters degree course

Postrequisites

Basic and profile disciplines of the EP Research practice

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

Discipline cycle	Profiling discipline
Course	1
Credits count	15
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.

Learning outcomes by discipline

- Prepares the results of scientific research based on modern achievements in science, technology and production on the formulated topic.

Prerequisites

Masters degree course

Postrequisites

Basic and profile disciplines of the EP Research practice

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

Discipline cycle	Profiling discipline
Course	1
Credits count	20
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.

Learning outcomes by discipline

- Prepares the results of scientific research based on modern achievements in science, technology and production on the formulated topic.

Prerequisites

Masters degree course

Postrequisites

Basic and profile disciplines of the EP

Pedagogical practice

Discipline cycle	Basic disciplines
Course	2
Credits count	10
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.

Learning outcomes by discipline

Examines the level of assimilation of the content of education by students, explores the educational environment

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

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

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

Discipline cycle	Profiling discipline
Course	2
Credits count	20
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.

Learning outcomes by discipline

- Prepares the results of scientific research based on modern achievements in science, technology and production on the formulated topic.

Prerequisites

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

Postrequisites

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

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

Discipline cycle	Profiling discipline
Course	2
Credits count	30
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.

Learning outcomes by discipline

- Prepares the results of scientific research based on modern achievements in science, technology and production on the formulated topic.

Prerequisites

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

Postrequisites

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

Research practice

Discipline cycle	Profiling discipline
Course	3

Credits count	10
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.

Learning outcomes by discipline
- Manages the organization of experiments and processing of the obtained data.

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
Course	3
Credits count	20
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.

Learning outcomes by discipline
- Prepares the results of scientific research based on modern achievements in science, technology and production on the formulated topic.

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

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

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

Discipline cycle	Profiling discipline
Course	3
Credits count	18
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.

Learning outcomes by discipline

- Prepares the results of scientific research based on modern achievements in science, technology and production on the formulated topic.

Prerequisites

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

Postrequisites

Final examination