

## The list of academic disciplines of the university component

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

**8D072 - Industrial and manufacturing branches**  
(Code and classification of the direction of training)

**0720**  
(Code in the International Standard Classification of Education)

**D111 - Food production**  
(Code and classification of the educational program group)

**8D07201 - Technology of food products**  
(Code and name of the educational program)

**Doctor of philosophy (PhD)**  
(Level of preparation)

set of 2024

**Developed**

By the Academic Committee of the OP  
The head of the AK Nurymkhan Gulnur Nesiptaikyzy  
OP Manager Idyryshev Berik Arystanbekuly

**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 Interpret the results of scientific research and the boundaries of their application.*

*ON7 Apply technologies of management of scientific research and teams in solving problems in the professional field of activity.*

### 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

*Doctoral student research work, including internship and doctoral dissertation II*

## Academic writing

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

### Short description of discipline

*Features of academic writing. The genre of academic writing. Writing grant applications and accounting documents for scientific projects. Bibliography and reference apparatus. Academic writing is a method of writing scientific texts, such as essays, theses, master`s and doctoral dissertations, scientific articles and monographs. Academic subscription is the realization by doctoral students of their thoughts and ideas, their justification and communication to users.*

### Purpose of studying of the discipline

*The purpose of the discipline academic writing is an essay, term paper, thesis, master`s and doctoral mastering the methodology of writing scientific texts, such as dissertations, scientific articles and monographs. Academic letter of doctoral students. Professional competence and communicative strengthening of communication. Formation of linguistic and pragmatic thinking.*

### Learning Outcomes

*ON1 Use the possibilities of written communication in the academic and scientific-technical field when writing research papers and conducting classes.*

### Learning outcomes by discipline

*Uses the possibilities of written communication in the academic and scientific-technical field when writing research papers and conducting classes*

*Uses the possibilities of written communication in the academic and scientific-technical field when writing research papers and conducting*

### Prerequisites

*Masters degree course*

### Postrequisites

*Doctoral student research work, including internship and doctoral dissertation VI*

## Innovative technological processes in the production of new foods

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

### Short description of discipline

*The use of modern technology and innovative technologies to reduce the duration of technological processes. New physical methods of processing food raw materials and products. The use of biologically active substances, natural food additives in order to accelerate the biochemical processes of raw materials. New methods and methods of heat treatment of unconventional energy sources and raw materials. New methods of forming and packaging of food products.*

### Purpose of studying of the discipline

*The purpose of the discipline is the formation of doctoral students` knowledge in the field of the development of innovative food technologies.*

### Learning Outcomes

*ON3 Implement methods and take part in the implementation of measures to improve production efficiency, aimed at reducing the*

consumption of raw materials, reducing labor intensity, increasing labor productivity.

ON4 To create scientifically based nutrition concepts based on the need for nutrients and energy for individual groups of the population.

### **Learning outcomes by discipline**

Implements and takes part in the implementation of measures to improve production efficiency, aimed at reducing the consumption of raw materials, reducing labor intensity, increasing labor productivity.

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Creates scientifically based nutrition concepts based on the need for nutrients and energy for individual groups of the population.

### **Prerequisites**

Masters degree course

### **Postrequisites**

Doctoral student research work, including internship and doctoral dissertation VI

## **Research methods**

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

### **Short description of discipline**

Methods of product quality assessment. Scientific knowledge, its principles, patterns of assimilation, levels of knowledge. Information approaches in research. The problem of choice in scientific research. Methods for assessing the quality of raw materials and finished products: spectrometric methods, polarimetric method, chromatographic method, rheological method, potentiometric method, methods of electrolysis and coulometric, radiometric analysis. Methods and methods of investigation of the physico-chemical composition of raw materials, finished products

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

The purpose of the discipline is the formation of knowledge among doctoral students in the field of modern methods of scientific research.

### **Learning Outcomes**

ON1 Use the possibilities of written communication in the academic and scientific-technical field when writing research papers and conducting classes.

### **Learning outcomes by discipline**

Interprets the results of scientific research and the boundaries of their application. Applies practical skills and teaching methods in higher education.

Interprets the results of scientific research and the boundaries of their application

Applies practical skills and teaching methods in higher education

### **Prerequisites**

Masters degree course

### **Postrequisites**

Doctoral student research work, including internship and doctoral dissertation IV

## **Doctoral student research work, 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 doctoral student's research work includes a review of literary sources, patent search, selection of raw materials and materials, development of experimental schemes, laboratory research, industrial approbation, analysis and processing of the obtained results, publication of scientific articles and defense of a doctoral dissertation. Doctoral students in the course of a scientific internship carry out research work in their field. Scientifically substantiates and publishes the results obtained.

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

Mastering scientific methods and performing scientific research on the topic of dissertations, the ability to analyze and generalize a scientific problem on the topic of dissertations.

### **Learning Outcomes**

ON2 Interpret the results of scientific research and the boundaries of their application.

ON9 Promote the search, selection and use of new information in the field of consumer market development, systematize and summarize information.

### **Learning outcomes by discipline**

- be able to formulate research goals and objectives
- mastering the basic principles of academic writing
- mastering advanced research methods of food raw materials and products

### **Prerequisites**

Basic and profile disciplines of the EP

### **Postrequisites**

Doctoral student research work, including internship and doctoral dissertation VI

## **Doctoral student research work, including internship and doctoral dissertation II**

Discipline cycle	Profiling discipline
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Course	1
Credits count	20
Knowledge control form	Total mark on practice

### Short description of discipline

*The doctoral student's research work includes a review of literary sources, patent search, selection of raw materials and materials, development of experimental schemes, laboratory research, industrial approbation, analysis and processing of the obtained results, publication of scientific articles and defense of a doctoral dissertation. Doctoral students in the course of a scientific internship carry out research work in their field. Scientifically substantiates and publishes the results obtained.*

### Purpose of studying of the discipline

*Mastering scientific methods and performing scientific research on the topic of dissertations, the ability to analyze and generalize a scientific problem on the topic of dissertations.*

### Learning Outcomes

*ON8 Conduct independent scientific research, characterized by academic integrity, based on modern theories and methods of analysis.*

*ON9 Promote the search, selection and use of new information in the field of consumer market development, systematize and summarize information.*

### Learning outcomes by discipline

- be able to formulate research goals and objectives
- mastering the basic principles of academic writing
- mastering advanced research methods of food raw materials and products

### Prerequisites

*Basic and profile disciplines of the EP*

### Postrequisites

*Doctoral student research work, including internship and doctoral dissertation VI*

## Pedagogical practice

Discipline cycle	Basic disciplines
Course	2
Credits count	10
Knowledge control form	Total mark on practice

### Short description of discipline

*pedagogical practice is aimed at achieving a high quality of postgraduate professional education, the implementation of theoretical knowledge, the development of professional qualities of a university teacher and the formation of competencies*

*of doctoral graduates in pedagogical activity and educational sphere Pedagogical practice is aimed at the formation of functional competencies, the development of abilities to perform tasks in professional and educational spheres. Pedagogical practice forms doctoral students' mastery of the skills of the educational process in higher educational institutions*

### Purpose of studying of the discipline

*formation of professional and personal competencies necessary for the organization of the educational process in higher education.*

### Learning Outcomes

*ON5 Possess various educational technologies, methods and techniques of oral and written presentation of subject material, contributing to improving the quality of the educational process.*

*ON6 Apply practical skills and teaching methods in higher education.*

### Learning outcomes by discipline

*Be able to plan laboratory and practical classes, work with methodological, educational literature and programs.*

### Prerequisites

*Method of teaching of engineering subjects*

### Postrequisites

*Research practice*

## Doctoral student research work, 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 doctoral student's research work includes a review of literary sources, patent search, selection of raw materials and materials, development of experimental schemes, laboratory research, industrial approbation, analysis and processing of the obtained results, publication of scientific articles and defense of a doctoral dissertation. Doctoral students in the course of a scientific internship carry out research work in their field. Scientifically substantiates and publishes the results obtained*

### Purpose of studying of the discipline

*Mastering scientific methods and performing scientific research on the topic of dissertations, the ability to analyze and generalize a scientific problem on the topic of dissertations.*

### Learning Outcomes

*ON10 Generate his own new scientific ideas, communicate his knowledge and ideas to the scientific community, expanding the boundaries of scientific knowledge.*

### Learning outcomes by discipline

- be able to formulate research goals and objectives

- mastering the basic principles of academic writing
- mastering advanced research methods of food raw materials and products

### Prerequisites

Basic and profile disciplines of the EP

### Postrequisites

Doctoral student research work, including internship and doctoral dissertation VI

## Doctoral student research work, 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 doctoral student's research work includes a review of literary sources, patent search, selection of raw materials and materials, development of experimental schemes, laboratory research, industrial approbation, analysis and processing of the obtained results, publication of scientific articles and defense of a doctoral dissertation. Doctoral students in the course of a scientific internship carry out research work in their field. Scientifically substantiates and publishes the results obtained

### Purpose of studying of the discipline

Mastering scientific methods and performing scientific research on the topic of dissertations, the ability to analyze and generalize a scientific problem on the topic of dissertations.

### Learning Outcomes

ON7 Apply technologies of management of scientific research and teams in solving problems in the professional field of activity.

ON10 Generate his own new scientific ideas, communicate his knowledge and ideas to the scientific community, expanding the boundaries of scientific knowledge.

### Learning outcomes by discipline

- be able to formulate research goals and objectives
- mastering the basic principles of academic writing
- mastering advanced research methods of food raw materials and products

### Prerequisites

Basic and profile disciplines of the EP

### Postrequisites

Doctoral student research work, including internship and doctoral dissertation VI

## Research practice

Discipline cycle	Profiling discipline
Course	3
Credits count	10
Knowledge control form	Total mark on practice

### Short description of discipline

acquisition of experience in the study of an actual scientific problem, as well as the selection of necessary materials for the dissertation

### Purpose of studying of the discipline

obtaining knowledge about innovative technologies of food production, knowledge of the methodology of scientific research

### Learning Outcomes

ON7 Apply technologies of management of scientific research and teams in solving problems in the professional field of activity.

ON8 Conduct independent scientific research, characterized by academic integrity, based on modern theories and methods of analysis.

### Learning outcomes by discipline

use basic and reference literature; plan research work

### Prerequisites

Research methods

### Postrequisites

Doctoral student research work, including internship and doctoral dissertation VI

## Doctoral student research work, 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 doctoral student's research work includes a review of literary sources, patent search, selection of raw materials and materials, development of experimental schemes, laboratory research, industrial approbation, analysis and processing of the obtained results, publication of scientific articles and defense of a doctoral dissertation. Doctoral students in the course of a scientific internship carry out research work in their field. Scientifically substantiates and publishes the results obtained

### Purpose of studying of the discipline

Mastering scientific methods and performing scientific research on the topic of dissertations, the ability to analyze and generalize a scientific problem on the topic of dissertations.

### Learning Outcomes

ON8 Conduct independent scientific research, characterized by academic integrity, based on modern theories and methods of analysis.

ON9 Promote the search, selection and use of new information in the field of consumer market development, systematize and summarize information.

ON10 Generate his own new scientific ideas, communicate his knowledge and ideas to the scientific community, expanding the boundaries of scientific knowledge.

#### **Learning outcomes by discipline**

- be able to formulate research goals and objectives
- mastering the basic principles of academic writing
- mastering advanced research methods of food raw materials and products

#### **Prerequisites**

Basic and profile disciplines of the EP

#### **Postrequisites**

Doctoral student research work, including internship and doctoral dissertation VI

### **Doctoral student research work, 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 doctoral student's research work includes a review of literary sources, patent search, selection of raw materials and materials, development of experimental schemes, laboratory research, industrial approbation, analysis and processing of the obtained results, publication of scientific articles and defense of a doctoral dissertation. Doctoral students in the course of a scientific internship carry out research work in their field. Scientifically substantiates and publishes the results obtained

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

Mastering scientific methods and performing scientific research on the topic of dissertations, the ability to analyze and generalize a scientific problem on the topic of dissertations.

#### **Learning Outcomes**

ON8 Conduct independent scientific research, characterized by academic integrity, based on modern theories and methods of analysis.

ON9 Promote the search, selection and use of new information in the field of consumer market development, systematize and summarize information.

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#### **Learning outcomes by discipline**

- be able to formulate research goals and objectives
- mastering the basic principles of academic writing
- mastering advanced research methods of food raw materials and products

#### **Prerequisites**

Basic and profile disciplines of the EP

#### **Postrequisites**

Final examination