

THE MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF
KAZAKHSTAN

M.AUEZOV SOUTH KAZAKHSTAN UNIVERSITY

«APPROVED BY»

Chairman of the Board Rector 
d.h.s., academician D.P. Kozhamzharova

« 25 » 02 2021 y.




EDUCATION PROGRAMME

8D05120 - "Biotechnological aspects in agro-industrial complex"

Registration number	-
Code and classification of the field of education	8D05 Natural sciences, mathematics and statistics
Code and classification of training areas	8D051 Biological and related sciences
Group of educational programs	D082 Biotechnology
Type of EP	acting
ISCE level	8
NQF level	8
SQF of education level	8
Language of learning	english
Typical duration of study	3 years
Form of study	scientific and pedagogical
The complexity of the EP, not less	180 credits
Distinctive features of EP	-
University Partner (JEP)	-
University Partner (TDEP)	-
Social Partner (DE)	-

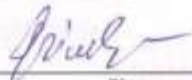
Shymkent, 2021

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EP was considered by the Committee on Innovative Learning Technologies and Methodological Support of higher school «Chemical Engineering and Biotechnology», Protocol № 1 from 25.01 2021.

Chairman of MC (Committee)  Aitkhulova R.E.
Sign

Considered and recommended for approval at the meeting of Educational and Methodical Council of M. Auezov SKU.
protocol № 5 from 23.02.2021.

Approved by the decision of the Academic Council of the University
protocol № 12 from 25.02 2021.

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Introduction

1. Scope

Designed for the implementation of bachelors training by educational program (hereinafter - EP) code 8D05120 - "Biotechnological aspects in agro-industrial complex" in RSE on right of economic management "M.Auezov South Kazakhstan University" of RK MES.

2. Regulatory documents

Education Act of the Republic of Kazakhstan (as amended and supplemented on 07/04/2018);

Standard rules for the operation of educational organizations implementing educational programs of higher and (or) postgraduate education, approved by order of the Minister of Education and Science of the Republic of Kazakhstan from October 30, 2018 No. 595 (registered with the Ministry of Justice of the Republic of Kazakhstan on October 31, 2018 No. 17657);

State obligatory standards of higher and postgraduate education, approved by order of the Minister of Education and Science of the Republic of Kazakhstan, October 31, 2018 No. 604;

The rules for the organization of educational process on credit technology education, approved by order of the Minister of Education and Science of the Republic of Kazakhstan on April 20, 2011 No. 152 as amended and supplemented of October 12, 2018 No. 563

Professional standard "Teacher" (Application to the order of the Chairman of the Board of the National Chamber of Entrepreneurs of Kazakhstan "Atameken" №133 dated June 8, 2017)

3. Educational programs concept

The goal of the educational program is coordinated with the mission of university and is aimed at preparing the intellectual elite of the country with advanced entrepreneurial skills, fluent in three languages, demonstrating conceptual, analytical and logical thinking skills, creative approach in professional activities, being able to work in national and international teams obtaining the lifelong strategy.

The educational program is harmonized with the 8th level of the National Qualifications Framework of the Republic of Kazakhstan, with Dublin descriptors, 3 cycle of the Framework for Qualification of the European Higher Education Area, also with Level 8 of the European Qualification Framework for Lifelong Learning.

The educational program is focused on professional and social order through the formation of professional competencies associated with the necessary types of research, practical and business activities, adjusted to meet the requirements of stakeholders.

The uniqueness of EP "8D05120 - Biotechnological aspects in agro-industrial complex" lies in the integration of complex knowledge and skills in an innovative environment that allows preparing doctoral students for diverse professional activities in the field of biotechnology.

The educational program aims to achieve learning outcomes through the organization of educational process using the principles of Bologna process, doctorate-centered learning, accessibility and inclusion.

Program learning outcomes are achieved through the following training events:

- classroom training: lectures, seminars, practical and laboratory classes - held in view of innovative teaching technologies, the use of the latest achievements of science, technology and information systems;
- extracurricular training: the independent work of the student, including under the guidance of a teacher, individual counseling;
- conducting professional practices, implementation of course and dissertation works.
- scientific-research work of doctorates, individual scientific works of doctorates, including doctoral dissertation and foreign scientific internships.

The university has taken measures to maintain academic integrity and academic freedom, protection from any kind of intolerance and discrimination against students.

The quality of EP is ensured by the involvement of stakeholders in its development and evaluation, systematic monitoring and review of its content.

4. Entry Requirements

Established according to the Model Rules for admission to studies in educational organizations that implement educational programs of higher and postgraduate education by order MES RK №600 on 10.31.2018

1. EDUCATION PROGRAMME PASSPORT

1.1 The purpose and objectives of education program by specialty

EP objectives: training of PhD doctors of new formation, capable of interpreting new knowledge by conducting advanced scientific research in the field of biotechnology.

EP tasks:

- the formation of socially responsible behavior in society, an understanding of the significance of professional ethical norms and adherence to these norms;
- providing basic undergraduate training that allows you to continue learning throughout life, to successfully adapt to changing conditions throughout their professional careers;
- ensuring the conditions for acquiring a high general intellectual level of development, mastering literate and developed speech, a culture of thinking and the skills of scientific organization of labor in the field of modern biotechnology and bioengineering;
- creation of conditions for intellectual, physical, spiritual, aesthetic development to ensure the possibility of their employment in the specialty or continuing education at subsequent levels of education.

1.2 List of qualifications and positions

The graduate of this EP with successful protection and a positive decision of the Control Committee in Education and Science under the Ministry of Education and Science of the Republic of Kazakhstan on the results of the examination of those who have fully completed the educational program of doctoral studies are awarded the degree in EP 8D05120 - "Biotechnological aspects in agro-industrial complex" of "Doctor of philosophy (PhD)".

Doctor of philosophy (PhD) by EP 8D05120 - "Biotechnological aspects in agro-industrial complex" can hold primary positions in research centers, laboratories and other units of biological, environmental and medical profile. Conduct scientific and teaching activities in research institutes and universities of biological, medical, environmental, biotechnological profile in accordance with the qualification requirements of the Qualification directory of positions of managers, specialists and other employees, approved by order of the Minister of Labor and Social Protection of the Republic of Kazakhstan from May 21, 2012 No. 201.

1.3 Qualification characteristics of the educational program graduate

1.3.1 Scope of professional activity

The scope of professional activity is activity in the area of production of biotechnological products for various purposes, scientific research in the field of biotechnological processes, the field of education.

1.3.2 Objects of professional activity

The objects of professional activity of graduates are research institutes and universities of biotechnological, biological, medical and agricultural fields; manufacturing plants and laboratories of the food and processing, microbiological and pharmaceutical industries; agricultural enterprises; environmental services and organizations; Universities and other educational groups.

1.3.3 Subjects of professional activity

Subjects of professional activity of the doctor PhD according to EP 8D05120 - "Biotechnological aspects in agro-industrial complex" are: biotechnological processes, biological objects of microbial, plant, animal origin, quality control of raw materials and products, teaching specialized disciplines.

1.3.4 Types of professional activity

A doctor PhD by EP 8D05120 - "Biotechnological aspects in agro-industrial complex" can do the following types of professional activity:

- production and technology;
- experimental research;
- selection;
- educational (pedagogical);
- financial and economic activities;
- consulting activities.

2. EP learning outcomes

PO1 Demonstrate systemic understanding, study, skills in terms of skills and research methods used in the field of biotechnology;

PO2 Justify knowledge and skills to identify opportunities, develop and direct relevant research projects for the development of biotechnology in Kazakhstan.

PO3 Build knowledge and promote technological solutions in the field of biotechnology for research centers and sectors: industrial, educational, academic and social;

PO4 The ability to communicate with the manufacturing sector, to translate research results into improved technologies, processes and products that stimulate the development of the country;

PO5 Create, disseminate and impart knowledge in accordance with ethical principles with a high sense of responsibility and social commitment.

PO6 Understand the application of the basic sciences and research methods in the field of cell biology, physiology, biochemistry and biotechnology;

PO7 Use research skills, including translational research, critical thinking, laboratory safety practices and experiment planning, designing experiments, from identifying problems to interpreting results.

PO8 Compile a critical analysis of results and data using advanced statistical tools such as bioinformatics, data storage and management.

PO9 Substantiate, make decisions, guided by scientific criteria and critical thinking in their practice of the researcher, guided by legal norms, ethics and official government regulations.

PO10 Justify new knowledge by conducting highly qualified scientific research that meets the requirements of peer review in this area of scientific knowledge (peer-review), contribute to the development of the scientific industry and deserve the publication of research results in scientific journals.

PO11 Develop theoretical and practical aspects in various fields of biotechnology, due to the needs of the state and the market.

3 COMPETENCES OF EP GRADUATE

3.1 Successful completion of training in EP contribute to the formation of the following competences of a graduate:

- core competencies (CC)
- professional competencies (PC).

Core competencies:

(KK1) *technical*

- the ability to use educational potential, knowledge and experience acquired during the study of technical disciplines in professional activities and use them to analyze and solve non-standard problem situations; the ability to carry out biotechnological processes, develop new ways of

obtaining biotechnological products and test them under production conditions; update and deepen the knowledge necessary for professional activities;

(KK2) research

- the ability to carry out a detailed analysis of scientific and technical information in the field of biotechnological production, with the purpose of scientific, patent and marketing support for ongoing research; the ability to summarize the results of research work in the form of scientific publications, to defend their position during the discussion and make professional decisions under conditions of uncertainty and risk;

KK3 economic, managerial and entrepreneurial

- the ability to know and understand the goals and methods of state regulation of the economy, the role of the public sector in the economy; master the basics of economic knowledge; possess the skills of critical thinking, interpretation, creativity analysis, drawing conclusions, evaluation; manage projects to achieve professional goals, manage staff, demonstrate entrepreneurial skills.

Professional competencies:

PC1 - the ability to represent the main trends of modern biology and biotechnology, theoretical and applied aspects of biotechnology, principles, methods, methods and means that form the basis of scientific and applied activity at all stages of the formation of creative solutions; from the formulation of laboratory and experimental studies to their practical implementation.

PC2 - apply information technologies in performing experimental research and analysis of the results obtained, forming management decisions of information processes and being able to work with information in global computer networks, demonstrate a systematic and creative approach to solving complex problems and be able to interpret new knowledge by conducting highly qualified scientific research that meets the requirements expert assessment in this area of scientific knowledge (peer-review), contributes to the development of scientific field and deserves publication in scientific journals.

PC3 - develop and implement projects to create new knowledge or practical applications in topical areas of biotechnology, as well as to adapt projects to possible unforeseen situations, to possess deep system knowledge and the ability to critically evaluate problems, approaches and trends reflecting the current state of the scientific discipline, research areas and areas professional practice.

3.2 Matrix of correlation of EP learning outcomes in general with modules formed by competencies

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
CC1	+		+	+		+	+		+		
CC 2	+	+				+	+	+			+
CC 3		+	+	+	+				+	+	+
PC 1		+	+	+			+				+
PC 2			+		+		+	+		+	+
PC 3	+	+	+		+			+	+	+	+

Designation:
full reachability PO +

4. SUMMARY TABLE REFLECTING THE VOLUME ASSIMILATED CREDITS OF EDUCATION PROGRAM MODULES

Course of Study	Semester	The number of mastered modules	The number of studied disciplines		Number of credits					Total hours	Total credits	Quantity	
			HTSC	EC	Theoretical training	Teaching practice	Research practice	SIWD	Final examination			exam	Diff. offset
1	1	2	2	3	25			5		900	30	5	1
	2	1				8		20		900	30		2
2	3	1					15	20		900	30		2
	4	1						30		900	30		1
3	5	1						30		900	30		1
	6	1						18	12	900	30		1
Total		3	2	3	25	8	15	123	12	5400	180	5	8

5. Information about disciplines

Module name	Cycle	HSC/ EC	Component Name	Brief course description (in 30-50 word)	Number of credits	Formed PO (codes)
Scientific bases and methods of research in the field of Biotechnology	BD	HTSC	Academic writing	Studies the principles of planning, writin, editing, and reviewing a scientific manuscript. The main structural elements of the article. Teaches the skills of choosing a scientific journal for publishing experimental results, citation, and preparing an article for publication. Allows you to improve your written English language skills for successful academic collaboration and career growth.	3	PO2, PO4, PO5, PO6, PO10, PO11
	BD	EC	Research methods	The organization, scientific research, the formation of skills for planning and carrying out research and development, the acquisition of knowledge, skills and knowledge in the field of biochemical and microbiological control, the study of monoclonal antibodies and their use in medicine, the cultivation of a hybrid in vivo and in vitro, the acquisition skills in biotechnology.	4	PO2, PO4, PO5, PO6, PO9, PO10
	BD	EC	Technologies for obtaining feed additives by fermentation of plant raw materials.	Considers biotechnological processes that are more or less related to the use of enzymes in the aspect of obtaining food and feed products. We also consider biotechnological enterprises that are not directly related to the food industry, which produce feed protein additiives and a number of other biologically active substances: enzymes, amino acids, organic acids, antibiotics, vitamins and other biotechnological processes for obtaining vaccines, various serums and therapeutic and preventive drugs.	6	PO2, PO4, PO5, PO6, PO10, PO11
	BD	EC	The use of enzymatic technologies in biotechnology for production of biologically	Discusses theoretical and practical issues of fermentation processes of plant raw materials in order to obtain various feed additives. Various schemes for obtaining feed additives and their varieties are considered in detail. Ways to improve their biological value, variations of inexpensive biosynthesis methods. Special attention is paid to fermentation processes, selection of effective		PO1, PO2, PO4, PO6, PO7, PO9

				inexpensive plant raw materials.					
	BD	EC	active additives Pedagogical practice	Deepen knowledge of practical and laboratory classes in the field of biotechnology, attendance of lectures by leading teachers of the department, as well as participation in educational and other types of work with students. Forms the skills of preparing and conducting various forms of classes, as well as the skills of guiding the cognitive, educational and creative activities of students in accordance with individual characteristics.	10		PO1, PO2, PO3, PO5, PO7, PO8, PO11		
Biotechnology production of target products	PD	OC	Biotechnological aspects of the production and use of biostimulants in the agroindustrial complex	Considers the issues of increasing the productivity of products, crop production and animal husbandry with the use of biostimulants in the agro-industrial complex, and the organization of biotechnological production and processing. The ways of producing biostimulants that improve the quality of plant products; breed-forming animals, and increase their value in the agro-industrial complex are outlined. The basic principles of the production of biostimulants in the agro-industrial complex, technologies that ensure development at the production level are given.	6		PO2, PO4, PO5, PO6, PO9, PO10		
	PD	EC	DNA markers for genetic analysis and breeding	Examines modern methods of molecular genetic analysis, current areas of genetic research and applied aspects of general and molecular genetics. Allows you to acquire scientific and methodological foundations of the method of real-time PCR and the determination of nucleotide sequences or DNA sequencing, provides specific examples of the use of these methods and computer-aided analysis of the data obtained in the educational process.			PO1, PO2, PO4, PO5, PO6, PO8, PO10		
	PD	EC	Construction of biotechnological devices and equipment	Characterizes the basic concepts and definitions, the choice of circuit solutions for the design of machines, the basic principles and methods of design. Justifies the general rules of design, layout design, the choice of the power circuit. Deepen knowledge of the methods of technological calculations of the equipment of the biotechnological industry, the constructional device and	6		PO2, PO3, PO4, PO5, PO6, PO7		

				the principles of operation of the equipment of biotechnological production.		
PD	EC	Prospects for the development of biotechnology		Characterizes the prospects for the development of biotechnology, and will cover areas such as: food industry; agricultural production; health care; chemical industry; bioenergy; monitoring and environmental protection, solid waste disposal, wastewater treatment and gas emissions; biogeotechnology - mining of mineral raw materials; bioelectronics, analytical devices.		PO2, PO3, PO5, PO6, PO10, PO11
		Research Practice		Deepening knowledge of the latest theoretical, methodological and technological achievements of domestic and foreign science, as well as consolidating the practical skills of applying modern methods of scientific research, processing and interpretation of experimental data in the dissertation research.	10	PO1, PO2, PO3, PO7, PO8, PO9, PO11
Module research work and Final work and final Certification		Research work of a doctoral student, including an internship and completing a doctoral dissertation		It characterizes the methods of conducting theoretical, experimental and applied research in the field of biotechnology, the preparation of an analytical review on the topic of the thesis. Examines the analysis of the results and conclusions on them, writing the research part of the dissertation, discussing it in the department with the subsequent defense.	123	PO1, PO3, PO5, PO8, PO9, PO11
		Writing and Defending a Doctoral Thesis		Considers the following mandatory sections: introduction (statement of the problem); a critical review of the literature and the state of the studied field of science; methods and tools for solving the task (methods and techniques of experiment or theoretical calculation, processing of results, etc.); the results of research conducted by the applicant, as well as technical, design and other decisions at individual stages of the work; analysis of the results; conclusion (conclusions).	12	PO1, PO2, PO3, PO5, PO7, PO8, PO11

APPROVAL SHEET

by Education Program code
«8D05120 - “Biotechnological aspects in agro-industrial complex»

Director DAQ




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Bazhirov T.S.