

MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF KAZAKHSTAN

M. AUEZOV SOUTH KAZAKHSTAN STATE UNIVERSITY

“APPROVE”

Rector _____

Kozhamzharova D.P.,

Doctor of Historical Sciences,

Academician

“ ____ ” _____ 20 ____.

STUDY PROGRAM

7M05210 – Ecology

Registration number	-
Code and classification of the field of education	7M05 – Natural sciences, mathematics and statistics
Code and classification of the training directions	7M052 – Environment
Group of study programs	M087 – Environmental protection technology
Type of the study program	Operating
Level according to the ISCED	7
Level according to the NQF	7
Level according to the SQF	7
Language of training	Russian
Typical training time	1 year
Differential characteristics of the study program	Profile
Partner University (joint study program)	63 credits
Partner University (dual diploma study program)	-
Social partner (online education)	-
Differential characteristics of the study program	-
Partner University (joint study program)	-

Shymkent, 2019

Developers:

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The study program was reviewed by the Committee for Innovative Technologies of Teaching and Methodical Ware of Chemical Engineering and Biotechnology High School, minutes №_____ dated “_____” _____201__.

Chairman of the Committee _____ Yessmurzayeva R.M.
signature

The study program was reviewed and recommended for the approval at the meeting of the Training Methodical Council of M. Auezov SKSU, minutes №_____ dated “_____” _____201__.

The study program was approved by the decision of the University’s Academic Council minutes №_____ dated “_____” _____201__.

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Introduction

1. Field of application

Designed to implement the training of masters of natural sciences according to the study program (hereafter – the SP) 7M05210 – Ecology at the Republican State Enterprise on the right of economic management “M. Auezov South Kazakhstan State University” of the Ministry of Education and Science of the Republic of Kazakhstan.

2. Regulatory documents

Law of the Republic of Kazakhstan “On Education” (as amended as of 04.07.2018);

Standard rules for activities of educational organizations that implement study programs of higher and (or) postgraduate education, approved by the order of the Minister of Education and Science of the Republic of Kazakhstan № 595 dated 30 October 2018 (registered in the Ministry of Justice of the Republic of Kazakhstan under № 17657 on 31 October 2018);

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

Rules for organization of training process on the credit technology of training, approved by the order of the Minister of Education and Science of the Republic of Kazakhstan № 152 dated 20 April 2011 as amended № 563 dated 12 October 2018;

The modular study program for the specialty 6M030100 – Ecology was developed in accordance with the regulatory documents: - the Law of the Republic of Kazakhstan “On Education” № 319-III 3PK dated 27 July 2007 (as amended as of 11 July 2017);

The state compulsory standard of postgraduate education, approved by the Decree of the Government of the Republic of Kazakhstan dated 23 August 2012 № 1080 (as amended as of 15 August 2017): - On approval of qualification requirements for educational activities, and list of documents confirming compliance with them, approved by the order of the Minister of Education and Science of the Republic of Kazakhstan dated 17 June 2015 № 391 (as amended as of 20 September 2016);

International standards ISO 14000 – Environmental management, ISO 14015 – Environmental assessment of sites and organizations (EASO).

3. Concept of the study program

The objective of the study program is coordinated with the mission of the university and is aimed at preparing the country’s intellectual elite with advanced knowledge, entrepreneurial skills, fluent in three languages, demonstrating skills of conceptual, analytical and logical thinking, creative approach in professional activities, able to work in a national and international team, learning a lifelong learning strategy.

The study program was developed in accordance with the Dublin descriptors, harmonized with the 7th level of the National Qualifications Framework of the Republic of Kazakhstan, the 2nd cycle of the Qualifications Framework of the European Higher Education Area, also with the 7th level of the European Qualifications Framework for the Lifelong Learning.

The study 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.

Uniqueness of the SP 7M05210 – Ecology for training of masters of natural sciences.

The SP of the profile Master's program 7M05210 – Ecology was accredited by independent international agency ASIIN (Germany) in 2014.

The SP focuses on the training of professional managers and specialists for environmental protection industries, ensures that graduates will acquire competencies of masters of natural sciences, ability to non-standard thinking and bold original solutions.

The study program is aimed to achieve learning outcomes through the organization of the training process using the principles of the Bologna process, student-centered learning, accessibility and inclusion.

The learning outcomes of the program are achieved through the following training events:

- classroom lessons: lectures, seminars, practical and laboratory lessons – are carried out using innovative technologies of training, the latest achievements of science, technologies and information systems;

- extracurricular activities: individual work of a student, including under the guidance of a teacher, individual consultations;

- carrying out professional practices, performing master dissertations;

- research activities of a master student: individual research activities of a student, including implementation of master dissertations and scientific traineeship.

4. Requirements to enrollees

The requirements were established according to the Model Rules for admission to training in educational organizations that implement study programs of higher and postgraduate education.

1. PASSPORT OF THE STUDY PROGRAM

1.1 The objective and tasks of the study program

Objective of the SP: Training of masters to formulate and solve modern scientific and practical problems in the field of environmental protection, own skills in the field of environmental management, environmental safety, effective ways to obtain environmentally friendly products.

The tasks of the SP:

- deepening theoretical and practical individual training of master students in the field of ecology, mastering the most important and sustainable knowledge by master students, ensuring holistic perception of the scientific picture of the world;
- development of students' ability to self-improvement and self-development, needs and skills of independent creative mastering new knowledge throughout their active life activities; and practical problems, successfully carry out research and management activities;
- providing master students with fundamental knowledge at the intersection of sciences, which guarantees them professional mobility in the real developing world;
- acquisition of skills for organizing and conducting research, obtaining necessary groundwork for continuing research in doctoral program.

1.2 List of qualifications and positions

A graduate of the study program 7M05210 – Ecology is awarded the degree of “Master of Natural Sciences”.

Masters of the SP 7M05210 – Ecology may hold the following positions: head of the relevant to the specialization unit in an enterprise, specialist, senior specialist, head of division of the state bodies in this field, researcher in design and research, research institutes, research institutions, design and engineering organizations, without requirements for work experience in accordance with the qualifications requirements of “Qualification directory of positions for heads, specialists and other employees”, approved by the order of the Minister of Labor and Social Protection of the Population of the Republic of Kazakhstan dated 21 May 2012 № 201-Ө-М.

1.3 Qualification characteristics of a graduate of the study program

1.3.1 Sphere of professional activity

The sphere of professional activity according to the SP 7M05210 – Ecology is educational, industrial, economic, managerial, research, environmental monitoring service, quality control of natural environment and human health.

1.3.2 Objects of professional activity of the graduates

- natural, anthropogenic, natural-economic, ecological-economic, industrial, social, public territorial systems and structures at the global, national, regional and local levels, as well as state planning, control, monitoring, expertise of environmental components of all forms of economic activity; education, enlightenment and public health, demographic processes, sustainable development programs at all levels;
- identification of problems, tasks and methods of scientific research;
- formulation of conclusions and practical recommendations based on representative and original research results;
- carrying out comprehensive studies of sectoral, regional, national and global environmental problems, development of recommendations for their resolution;
- assessment of the state, sustainability and forecast of development of natural complexes;
- implementation of environmental monitoring;
- carrying out environmental impact assessment of various types of project tasks;
- control and auditing activities, environmental audit;
- management of activities of division, sector, working group;
- determination of order for achievement of goals and specification of tasks;

- training methodical activities on planning environmental education for sustainable development.

1.3.3 Subjects of professional activity

The subjects of professional activity of masters in the SP 7M05210 – Ecology:

- planning and implementation of environmental protection measures in the state and non-state organizations;
- natural and urbanized ecosystems and their components; biosphere and its components; environmental monitoring and marketing;
- analysis, inspection and control of the state of the environment; compilation of prognostic models; managerial and consulting functions in the field of environmental protection;
- process of creating regulatory and organizational documentation in the field of environmental management, environmental safety, taking measures to protect the environment from negative impacts, environmental management.

1.3.4 Types of professional activity

Master in the SP 7M05210 – Ecology can perform the following types of professional activities:

- environmental protection;
- research;
- design and production;
- control and auditing;
- organizational and managerial.

2. Learning outcomes according to the study program

LO1 – demonstrate knowledge of foreign language, understanding and abstracting sources on the topic of scientific research and scientific and research activities, express knowledge in a correct, logically related oral and written form;

LO2 – apply basic approaches and principles of modern psychology and management in solving issues in the field of ecology and scientific research;

LO3 – apply methodology for the study of phenomena and processes that affect the geosphere of the Earth, characterize theoretical foundations of urgent problems of geoecology and landscape ecology ;

LO4 – apply modern trends in the development of low-waste and non-waste technologies in Kazakhstan and in the world, to determine the most effective directions for the use of natural resources, to plan and conduct research and experimental-research activities in a chosen scientific specialty;

LO5 – describe the possibilities of advanced scientific methods and technical means and use them at the level necessary for the prompt solution of environmental and technological problems;

LO6 – represent design, research, inventive, innovative activities, as well as introduce elements of technology commercialization in the field of environmental protection;

LO7 – own IT technologies to solve problems using automated design systems, implement high-tech processes in production management and implement intelligent, previously unused technologies and techniques in the field of environmental protection;

LO8 – describe the main physical and chemical patterns of cleaning and processing of liquid, solid and gaseous wastes, the sequence of technological operations and the values of the optimal modes of non-waste and low-waste technologies;

LO9 – calculate technical and environmental safety for the environment, apply ecosystem approach when developing a strategy for the development of biological resources;

LO10 – analyze principles of environmental impact assessment, audit and monitoring, practice legal and regulatory documents that define the legal framework that regulates and

organizes state environmental impact assessment and audit. demonstrate innovations in the use of teaching methods, satisfy at a higher level all the requirements for personal qualities.

3 COMPETENCES OF A GRADUATE OF THE STUDY PROGRAM

3.1 Successful completion of training in the SP helps a graduate to form the following key competencies:

- Key competencies (KC)
- Professional competencies (PC).

Key competencies:

Linguistic and computer (KC1)

- have basic communication skills in the language: the ability to understand, express and interpret concepts, thoughts, feelings, facts and opinions, both verbally and in writing (listening, speaking, reading, writing) in the relevant range of social and cultural contexts (in education and learning, at work, at home and at leisure). Have skills of mediation and intercultural understanding, own IT-technologies for solving problems using automated design systems;

Technical (KC2)

- give a legal assessment of actions related to environmental issues; develop and maintain technical documentation in terms of quality of work; use modern information technologies in solving complex issues of design, survey and research works; possess methods of searching and using scientific and technical information; 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; ability to use information and communication technologies, to update and deepen the knowledge necessary for professional activities and continuing education in doctoral studies;

Economic and entrepreneurial (KC3)

- possess the basics of economic knowledge, have a scientific understanding of management, marketing, finance, etc .; know and understand the goals and methods of state regulation of the economy, the role of the public sector in the economy; the ability to turn ideas into actions, plan and manage projects to achieve professional goals, understand ethical values: be able to work with people, has knowledge in the field of interaction with customers, personnel management, interaction with users, work with permitting and authorized bodies, work with government representatives : know the basics of the legal system and legislation of Kazakhstan in the field of environmental protection, trends in the social development of society;

Research (KC4)

- conduct research in the field of ecology; carry out environmental monitoring and indication of the state of the environment; assess and predict changes in the state of ecological systems of different levels; the ability to solve problems in professional activity on the basis of analysis and synthesis and conduct analytical, imitation and experimental environmental studies in the field of environmental protection, the ability to critically evaluate data and draw conclusions, analyze the basic laws of phase equilibria and kinetics of cleaning and processing liquid, solid and gaseous waste , the ability to summarize the results of research work in the form of scientific publications, to defend their position during the discussion and amb the professional nature of the decision under uncertainty and risk.

The professional competencies are characterized by the fact that a graduate can:

PC1 – develop scientific and technical documentation, issue scientific and technical reports, reviews, publications on the results of the research performed;

PC2 – use intellectual property protection procedures, conduct a patent search and own technologies for filing applications for an invention;

PC3 – conduct an expertise of processes, materials, test methods, be able to carry out marketing research, analyze the full technological cycle of waste-free and low-waste production;

PC4 – develop environmental protection measures of innovative solutions in production and transport, manage the actual technological processes of cleaning and processing liquid, solid and gaseous wastes.

3.2 Matrix of correlation of learning outcomes in the SP in general with the formed competencies of modules

	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8	LO9	LO10
KC1		+		+			+			+
KC2	+	+	+	+	+	+	+	+	+	+
KC3			+	+	+	+	+	+		+
KC4	+	+	+		+		+		+	+
PC1	+	+	+	+		+		+		+
PC2		+	+		+		+		+	
PC3			+		+	+	+		+	+
PC4	+	+	+	+		+		+		+

4. SUMMARY TABLE SHOWING THE AMOUNT OF CREDITS MASTERED BY THE STUDY PROGRAM'S MODULES

Course of training	Semester	Amount of the mastered modules	Amount of the studied disciplines		Amount of KZ credits					Total in hours	Total KZ credits	Amount	
			University component	Optional component	Theoretical training	Industrial practice	Research practice	Experimental and research activities of a master student	Final attestation			exam	dif. pass
1	1	3	4	4	28	-	-	4		960	32	7	1
	2	2	-	4	-	10	-	9	12	930	31	-	2
Total			4	8	28	10	-	13	12	1890	63	7	3

5. Information about the disciplines

Module name	Cycle	UC/OC	Component name	Brief description of a discipline (30-50 words)	Amount of credits	Formed LO (codes)
Management and business communication module	BD	UC	Foreign language (professional)	Mastering the main types of reading foreign-language original sources with varying degrees of content coverage. Development of skills for preparing written communications on scientific topics in the specialty: scientific report, abstracts on the topic of scientific research, abstracting of original sources in a foreign language, annotation of a scientific text, summary. Understanding the general content of authentic records. Listening to lectures, messages containing professional information.	3	LO1
	BD	UC	Management	Discussion of characteristics, organization, management and evolution of management thought. The study of the internal and external environment of the organization. Statement of ethics, social responsibility and communication. Modeling management decision making. Structuring management functions: planning, organization, motivation, control. Definition of group dynamics. Leadership research: power, influence, and leadership styles. Disclosure of conflict management, stress and change management.	3	LO2
	BD	UC	Psychology of management	The main approaches and principles of modern psychological science, necessary in the professional activities of highly qualified specialists. Formation of the scientific-theoretical worldview on the fundamental psychological concepts, the development of ideas about psychological science, revealing the content of the discipline. Formation of skills and abilities of psychological researches of a personality, acquaintance with the main methods of experimental psychological research and the main directions of psychocorrectional	3	LO2

				work. Features of conflict management, stress, and methods of their resolution.		
Research methodology	BD	OC	Actual problems of geology and landscape ecology	Studies changes in the Geosphere of the Earth under the influence of human activity and emerging geocological problems. Considers the basic concepts, object, tasks, methods, evolution of views, place and connection of actual problems of Geocology and landscape ecology among the earth Sciences. Theoretical and methodological bases of actual problems of Geocology and landscape ecology. System character of actual problems of Geocology and landscape ecology.	4	LO3 LO4
	BD	OC	Modern problems of ecology	Considers nature management and environmental problems in the early stages of civilization, the current impact of human production on nature, the scale of human impact on the environment, the impact of human production on individual components of nature, forecasts of negative phenomena for the biosphere, ways to solve environmental problems and environmental management.		LO2 LO4 LO8
	BD	OC	Methodology of experiment	Studies creation of experimental work program; methods and techniques of intervention in the object of study; conditions for implementation of experimental work procedure; ways and methods of fixing the course and results of the experiment. Demonstrates the means of experiment (devices, installations, models, etc.); drawing up a plan for the experiment, the best from one or another point of view; validation of the results obtained and their accuracy; the choice of the method of processing the experimental data and the form of presentation of results; analysis of the results and their interpretation in environmental terms.	5	LO4 LO5 LO6
Scientific and technological module	BD	OC	Organization of environmental audit	Examines the types of environmental audit and the basis for its implementation. Analyzes the principles of environmental audit. Discusses and details the decision on mandatory environmental audit. It illustrates the	5	LO4 LO5 LO10

				features of the mandatory environmental audit. Develop audit of environmental management systems. Discusses the Legislation of the Republic of Kazakhstan in the field of environmental audit, legal and regulatory documents that define the legal framework.		
	BD	OC	Environmental expertise	Explores the basic concepts and definitions. Examines the history of environmental impact assessment in Kazakhstan and abroad. Analyzes the goals, principles and objectives of the state environmental expertise, discusses the Legislation of the Republic of Kazakhstan in the field of environmental expertise, legal and regulatory documents that define the legal framework governing and organizing the state environmental expertise.		LO4 LO5 LO10
	BD	OC	Expertise and monitoring of environmental safety of environmental management	Explores the definition and objectives of environmental monitoring and examination of common beliefs about the monitoring and examination of environmental security environmental Sciences, theoretical and methodical fundamentals of ecological expertise, principles of an estimation of ecological safety, principles of environmental assessment, Considering modern methods of environmental assessment, the procedure of state ecological expertise, the introduction and consideration of documentation.	5	LO6 LO7 LO10
	BD	OC	Ecosystem studies of biological resources	Explores methodological aspects of the ecosystem studies of biological resources, the application of the ecosystem approach in the elaboration of the development strategy of biological resources, systems and species for ecosystem studies of biological resources, environmental monitoring as one of the main methods of studying the dynamics of ecosystems (biogeocenoses), occurring under the influence of natural and anthropogenic factors, the historical approach as a tool for predicting the state of ecosystems.		LO6 LO7 LO9 LO10
			Industrial practice	Practical study of the latest theoretical, methodological	10	LO4

			and technological achievements of domestic and foreign science: a modern methodology of scientific research; analysis of the state of development of waste-free and low-waste technologies and science in the world and Kazakhstan; the role of science and innovation in the improvement and modernization of technology; basic laws of market economy, objectives, principles and mechanisms of innovative development of the Kazakhstan economy.		LO5 LO6 LO7	
Module of experimental research and final attestation		Experimental research activities of a master student	Conducting experimental research work in accordance with the plan of the academic period with the use of the instrumental base of the chair's laboratory and the analytical instruments of Testing regional laboratory of engineering profile and Sapa. The use of information technology and computer programs in the performance of final qualifying work. Selection and justification of the technological scheme of production, the calculation of the basic equipment in accordance with the theme of the master's dissertation. Determination of the economic efficiency of the developed technology. Formation of conclusions in all sections of the work. Preparation of an article on a research topic for publication in a scientific journal, proceedings of scientific conferences or a collection of papers of master and doctoral students. Formation of the necessary skills for research by master students on the topic of the dissertation.	13	LO5 LO6 LO7 LO8	
		Execution and defense of a master's project	The final qualification work of the graduate of the master's program, confirming the competencies acquired during the training process in accordance with the chosen specialization of training. Defense of the master's project at an open meeting of the Attestation Commission with the participation of the chairman of the commission and at least half of its members. The procedure and regulations for the defense of a master's dissertation are established by the chairman.	12	LO1 LO4 LO5	

COORDINATION SHEET
on the Study program 7M05210 – Ecology

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