MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF KAZAKHSTAN

M. AUEZOV SOUTH KAZAKHSTAN UNIVERSITY

"APPROVE"
Chairman of the Board-Rector
d.h.s., academician
Kozhamzharova D.P.
"___" _____ 2021y.

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	2 years
Training direction	Scientific-pedagogical
Working hours of the study program	120 credits
Differential characteristics of the study program	-
Partner University (joint study program)	RUDN University
Partner University (dual diploma study program)	-
Social partner (online education)	-

Shymkent, 2021

1

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 No. 7 dated "22" 02 201__.

Protokol №_____ from "_____" _____2021.

Chairman of the Committee _____ Aitkulova R.
signature

Considered and recommended for the approval at the meeting of Educational and Methodical Council of M. Auezov SKU
Protokol №5 from "23" 02 2021.

Approved by the decissionof the Academic Council of the University
Protokol №_____ from "25" 02 2021.

2

CONTENT

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 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);

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

Environmental Code of the Republic of Kazakhstan. Code of the Republic of Kazakhstan dated January 2, 2021 № 400-VI.

Professional standard Geoecological research (Geoecologist) No. 263 dated 26.12.2019; Professional standard Forest reproduction and afforestation No. 263 dated 26.12.2019; Production technology from No. 263 dated 26.12.2019; Professional standard "Teacher" (Appendix to the order of the Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" No. 133 dated June 8, 2017).

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

3. Concept of the study program

The purpose of the educational program is coordinated with the mission of the university and is aimed at generating new competencies, training of a leader who translates research and entrepreneurial thinking and culture.

The study program was developed in accordance with the Dublin descriptors, harmonized with the 7^{th} level of the National Qualifications Framework of the Republic of Kazakhstan, the 2^{nd} cycle of the Qualifications Framework of the European Higher Education Area, also with the 7^{th} 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-pedagogical sciences.

The SP of the scientific-pedagogical 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 the fields of environmental engineering, teachers in the field of environmental engineering; provides graduates with the acquisition of competencies of Master of Natural Sciences, the 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

The objective of SP: Training of highly qualified masters able to formulate and solve modern scientific and practical problems of national and global level in the field of environmental protection and sustainable development of society.

The tasks of the SP:

- training specialists for teaching in universities and colleges;
- training highly qualified specialists for research activities in the field of ecology;
- training specialists for various levels of enterprises and organizations dealing with environmental issues;
- ensuring conditions for acquiring high intellectual level of development, mastering logical and critical thinking and skills of scientific organization of labor in scientific-pedagogical activities.

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: teacher in higher educational institutions, 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, managerial, research, environmental monitoring service, quality control of natural environment and human health, geoecological research, forest reproduction and forest breeding, technology of productions.

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, examination 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;
- environmental training and education in universities, colleges, schools, gymnasiums, etc.;
- 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.
- technology of production;
- geoecological research;
- forest reproduction and forest breeding.
-

1.3.4 Types of professional activity

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

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

2. Learning outcomes according to the study program

LO1- able to demonstrate knowledge of history and philosophy of natural and technical sciences, fundamental scientific and professional training, solve modern scientific and practical problems, plan and conduct research and experimental research activities;

LO2 - to apply new methodologies of psychological and pedagogical sciences, geoecological studies of phenomena and processes, the concept of environmental education, giving an idea of the impact of pollution on the environment;

LO3 – apply new directions of development and achievements of science and technology in the field of environmental protection, including methods of mathematical forecasting and modeling of processes, systems of process equipment, as well as creation of non-waste technologies based on the principle of a single technological raw material production;

LO4 – to demonstrate modern trends in the development of low-waste and non-waste technologies in Kazakhstan and in the world, to reveal the most effective directions for the use of natural resources, to independently assess the key problems of environmental protection, forest reproduction and afforestation;

LO5 – 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;

LO6 – develop technologies of writing applications for inventions, in particular, writing the essence of theoretical or technological solutions to achieve the goal (element of novelty) and writing formulas of inventions;

LO7 – to use the state and foreign languages for full-fledged information acquisition, to express knowledge in a correct, logically connected oral and written form; apply the skills of public speaking, argumentation, discussion and polemics; practical analysis of various kinds of reasoning;

LO8 – provide technical and environmental safety, protection of human life, legal norms and economic problems, development of regulatory documents, including in the state language on the declaration of the level of safety of the constituent parts of chemical plants and their class of danger in general;

LO9 – apply the basics of environmental expertise and audit to create green waste-free technologies, taking into account the criteria of technological processes to solve problems in the field of environmental protection, geoecology and landscape ecology;

LO10 – find relationship between pollution and environmental quality, technological processes of waste-free and low-waste technologies and technical economic indicators of the processes.

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)

- ability to master basic communication skills in a foreign language in a professional field, both verbally and in writing, mediation and intercultural understanding; ability to confidently and critically use modern information and digital technologies for work, leisure and communications, mastering the skills of using, restoring, assessing, storing, presenting and exchanging information through a computer, participating in collaborating networks using the Internet in the field of professional activity;

Technical (KC2)

- 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 assess the need for resources and plan their use in solving problems in professional activities; ability to apply innovation, ability to use information and communication technologies, to update and deepen the knowledge necessary for professional activities and continuing education in doctoral program;

Economic and entrepreneurial (KC3)

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

Research (KC4)

- ability to identify scientific nature of problems in the professional field, ability to solve problems in professional activity on the basis of analysis and synthesis and conduct analytical, simulation and experimental environmental studies in the field of environmental protection, ability to critically evaluate data and draw conclusions, analyze basic laws of phase equilibria and kinetics of cleaning and processing of liquid, solid and gaseous wastes, ability to summarize

results of research activities in the form of scientific publications, to defend own position during debates and take decisions of professional nature under uncertainty and risk.

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

PC1 – apply innovative methods for solving engineering problems, use intellectual property protection procedures, analyze full technological cycles of waste-free and low-waste productions;

PC2 – apply basic principles of rational use of natural resources, develop proposals for improving technological processes and equipment for cleaning and processing of industrial and household wastes;

PC3 – be able to carry out marketing research, develop environmental protection measures of innovative solutions in production and transport, conduct economic analysis of costs and effectiveness of technological process of cleaning and processing liquid, solid and gaseous wastes;

PC4 – conduct analysis of technological processes to select ways, measures and means of managing product quality, conduct patent search and own technologies for filing applications for inventions.

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	Teaching practice	Research practice	Research activities of a master student	Final attestation			exam	dif. pass
1	1	5	5	3	29			1		900	30	6	2
	2	4	1	5	23	4		3		900	30	4	2
2	3	2		3	21		7	2		900	30	3	2
	4	1						18	12	900	30		1
Total			6	11	73	4	7	24	12	3600	120	13	7

5. Information about the disciplines

Module name	Cycle	HSC/EC	Component name	Brief description of a discipline (30-50 words)	Amount of credits	Formed LO (codes)
Scientific pedagogical training module	BD	HSC	History and philosophy of science	Studies history and philosophy of the natural and technical sciences. Studies modern European science in culture and civilization, the emergence of science and its historical dynamics, structure of scientific knowledge, philosophical problems of specific sciences. Considers communicative technologies of the XXI century and their role in modern science, philosophical problems of the development of modern global civilization, modern actual methodological and philosophical problems of natural and social sciences and humanities.	4	LO1
	BD	HSC	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.	4	LO7
	BD	HSC	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 habits of psychological research of a personality, acquaintance	4	LO2

				with the main methods of experimentally - psychological research and the main directions of psycho-correction work. Features of conflict management, stress and methods of their resolution.		
Methodical basics of teaching	BD	HSC	Higer School Pedagogy	Studies modern paradigms of higher education and the system of higher professional education in Kazakhstan, the methodology of pedagogical science, and the professional competence of a teacher of higher education. Considers the organization of the educational process on the basis of the credit system of education in higher education, methods and forms of education in the preparation of future specialists. new educational technologies in higher education. Considers a higher school as a social institution of education for the formation of a specialist's personality	4	LO2
	ChD	HSC	Teaching Metods of Special Disciplines	Studies the concept of environmental education, goals, objectives and the role of environmental and biological education in the education system, the relationship of ecology and biology, belonging to the theory and methodology of teaching ecology to pedagogical sciences profile disciplines. Considers the requirements for the professional activities of the teacher-ecologist, the implementation of the competence-based approach in education, multimedia technology training. Solving problems by compiling a group project, conducting a role-playing game.	5	LO2
	BD	HSC	Pedagogical Practice	The development of professional research culture in the field of ecology, as a condition of pedagogical skills and pedagogical creativity, the formation of professional pedagogical skills, culture of scientific and pedagogical thinking. Development of training methodical documents on the main discipline. Attendance of lectures of leading teachers. Preparation and conduct of	4	LO2

				practical and laboratory classes in special disciplines. Development of new active forms of conducting classes with students and their application in practical classes.		
			Research practice	Practical study of the latest theoretical, methodological and technological achievements of domestic and foreign science in the field of environmental protection; modern research methodology; analysis of the state of development of ecology and science in the world and Kazakhstan. Technologies for the separation of crude oil into fractions of various boiling temperature ranges. Current trends in the development of low-waste and non-waste industries. Performing theoretical and experimental studies on the topic of the dissertation.	7	LO1 LO4
Geoecology Research and Creative Activity	ChD	EC	Rational Use of Natural Resources	Considers the concept of environmental management. Assesses the use of natural resources and its place in the cycle of natural Sciences, extensive and intensive way of development of natural resources. Analyzes the rational and irrational use of natural resources, the definition of natural resources, their classification and importance, forms and uses. Selects research methods used in environmental management. Afforestation to control dry winds, drought and soil erosion. Applies the concept of ecological crisis and ecological catastrophe.	4	LO4
	ChD	EC	Digitalization in Ecology and Nature Management	Considers the digital economy in ensuring environmental safety, IT technologies for monitoring natural and anthropogenic systems and digital services in the field of environmental management.		LO5
	BD	EC	Actual Problems of Geoecology and Landscape Ecology	Studies changes in the Geosphere of the Earth under the influence of human activity and emerging geoecological problems. Considers the basic concepts, object, tasks, methods, evolution of views, place and connection of actual problems of Geoecology and the land reclamation	6	LO9

				section, covering the improvement of the natural conditions of agricultural land with protective forest plantations. Theoretical and methodological bases of actual problems of Geoecology and landscape ecology. System character of actual problems of Geoecology and landscape ecology.		
	BD	EC	Modern Problems of Ecology	Consider nature management and environmental problems at the early stages of the development of civilization, the current impact of human production on nature, the extent of human impact on the environment, the effects of industrial activities process for the production of petroleum products, various types of fuel and raw materials for subsequent chemical processing, forecasts of negative phenomena for the biosphere, ways to solve environmental and environmental problems.		LO9
Audit and Environmental Impact Assessment	BD	EC	Organization of Environmental Audit	Considers the principles of the Environmental Code of the Republic of Kazakhstan. Regulation of public relations in the sphere of interaction between man and nature, the activities of enterprises that have an impact on the environment. Discusses and details decisions on the adoption of legal and regulatory documents in the field of environmental monitoring.	4	LO8 LO8
	BD	EC	Ecological 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.		LO9
	ChD	EC	Environmental Impact	Considers the assessment and stages of environmental	6	LO8

			Assessment	impact of industrial enterprises, the procedure for environmental impact assessment. Compares the classification of objects of environmental impact assessment by the significance and completeness of the assessment. Explores the documentation of the assessment of the impact on the environment. Develops a methodical provision of the assessment of the impact on the environment.		
		EC	Environmental Assessment and Mapping of Localities in South Region	Investigates the theoretical basis of environmental mapping and assessment of SKR, the content and methods of environmental mapping, mapping of atmospheric problems, mapping of land-based pollution, mapping of physical pollution, mapping of soil pollution and other deposition media, mapping of geological and geomorphological pollution, Considers bio-ecological aspects of mapping, geographical analysis pollution.		LO8
	ChD	EC	Examination and Monitoring of Ecological Nature Management Safety	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, in an interdisciplinary scientific field uniting studies of composition, structure, properties, process c, physical and geochemical fields of the Earth's geospheres as a human environment and other organisms.	7	LO9
	ChD	EC	Ecosystem Studies of Biological Resources	It studies methods of analysis of species diversity at different levels, strategies for restoration and conservation of biodiversity of ecosystems and urban systems of Kazakhstan, modern research areas for the		LO4

				assessment, conservation of biological diversity of ecosystems and urban systems of Kazakhstan. Analyzes international biodiversity research programs. Discusses the National Strategy of Kazakhstan and the action Plan for the conservation of biodiversity, on issues of environmental protection, forest reproduction and afforestation.		
	ChD	EC	Assessment and Management of Environmental Rrisk	Considers the main provisions of the theory of risk, concept, sources of risk and risk factors. Studies the development of risk in industrial facilities, the basics of the methodology of analysis, assessment and risk management: quantitative risk indicators, acceptable risk, risk comparison, environmental risk management in industry and energy, environmental assessment of projects. Examines the assessment of environmental risks of major accidents and their management.	7	LO8
	ChD	EC	Biological Diversity of Ecosystems and Urban Systems of RK	It studies methods of analysis of species diversity at different levels, strategies for restoration and conservation of biodiversity of ecosystems and urban systems of Kazakhstan, modern research areas for the assessment, conservation of biological diversity of ecosystems and urban systems of Kazakhstan. Analyzes international biodiversity research programs. Discusses the National Strategy of Kazakhstan and the action Plan for the conservation of biodiversity, on issues of environmental protection, forest reproduction and afforestation		LO9
Environmental management and measuring instruments in ecology	ChD	EC	Study of the Latest Achievements in the Field of Waste Processing	Considers the classification of waste according to their aggregate state and the risk of impact on the environment, sources of education, the volume of accumulation, morphological and chemical composition, characteristics of waste management system, the scheme of sanitary cleaning of cities from household and	7	LO8 LO9

				industrial waste. He investigates the main methods of industrial processing of solid waste, disposal of solid waste by storage at landfills and landfills.		
	ChD	EC	Modern Methods and Measuring Instruments in Ecology	Considers methods and means of monitoring and control over the state of the environment, contact methods of environmental control, remote methods of environmental control, biological methods of environmental control. Analyzes environmental control, modern methods of air pollution control, methods of atomic spectroscopy, reporting on the results of instrumental measurements.		LO8
	BD	EC	Ecological Standardization, Certification and Licensing	Examines the activities to establish norms, rules and characteristics in order to ensure product safety, State standards of the Republic of Kazakhstan, international standards, Kazakhstan classifiers of technical and economic standardization. It examines the standards of industries, enterprises, scientific and technical, engineering companies and other public associations, government agencies engaged in standardization, licensing of certain activities in the field of environmental protection.	5	LO8
	BD	EC	Methodology of Scientific-Creative and Inventive Activity	Considers technologies for writing applications for inventions. Forms the knowledge, skills and abilities necessary for the management of technical creativity and the development of creative abilities, and a range of skills, conducts patent research and legal protection of inventions created on the basis of fluency in all components of inventive activity. Studies methods of collective generation of ideas, methods of expert assessments, methods of logical analysis, their essence and features. Considers the theory of solving inventive problems.		LO6
	ChD	EC	Ecological Safety	Examines the basic concepts and methodological	6	LO3

			Tehnology in Industry	principles of the formation of waste-free production, the basic concepts and methods of organizing low-waste production, the requirements for waste-free technological processes and equipment, the problems of developing highly efficient technological processes, environmental protection processes and technologies. Analyzes the mathematical modeling of technological processes, taking into account the criteria of chemical-technological and environmental factors for efficiency indicators.		
	ChD	EC	Green Technologies in Pproduction and Transport	Considers environmental activities in Kazakhstan, monitoring and control of the environment in transport. Studies the organization of the state environmental control of emissions of pollutants into the atmosphere at transport enterprises. Analyzes the management of environmental activities in the transport and transportation system in Kazakhstan, international cooperation in the field of environmental protection in transport, the introduction of green technologies.		LO9
Module research work and Final Attestation			Research work of a master student, including passing an internship and completing a master`s thesis	Conducts an analytical review of the known methods of obtaining inorganic compounds in accordance with the goal and objectives of the dissertation research, experimental research work according to the plan of the academic period using the instrumental base of the chair's laboratory, mastering the methods of analysis of raw materials, semi-products and products using analytical instruments. Uses information technology and computer programs in the performance of final qualifying work. Conducts the selection and justification of the technological scheme of production in accordance with the theme of the master's dissertation. Determines the economic efficiency of the developed technology. Generates conclusions, modeling, processing and	24	LO1 LO3 LO10

				interpretation of the results.		
			Execution and Defense of Master Thesis	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	LO7 LO1 LO5 LO7

COORDINATION SHEET

on the Study program 7M05210 – Ecology

Director of the AID _____ A.Naukenova

Head of the ASD _____ U.Nazarbek

Director of the DEC _____ T.Bazhirov

21