Non-commercial joint-stock company «Kazakh national agrarian research university»

AGREED	
Head of the RSU "Ball	kash-Alakol
basin Inspection"	R.Imanber 2023 y.
101-1-1-02-346x + 103403-01-100-01 1-1-1-102-346x + 103403-01-100-01 1-10-102-102-102-01-102-01 1-102-102-01-102-01-01-01-01-01-01-01-01-01-01-01-01-01-	



EDUCATIONAL PROGRAM

«7M08601- Water resources management using IT-technologies»

Degree awarded: Master of Agricultural Sciences under the educational programme "7M08601- Water resources management using IT-technologies» (scientific and pedagogical direction)

Almaty, 2023 y.

Approved at the meeting of the Department «Water resources and melioration» Protocol $N_{\underline{8}}$, «<u>4</u>» <u>03</u> 2023 y.

Head of the department ________________Ye.Zhaparkulova

Considered at meetings Academic Committee of the Faculty of «Water, Land and Forest Resources» Protocol $N_{27} \ll 23$ 2023 Chairman of the AC of the faculty L.Makhmudova

Reviewed by the Educational Methodological Council of the University and recommended to the Academic Council

Protocol $N_{2} \stackrel{@}{=} \alpha \alpha \beta \stackrel{@}{=} N_{2} \stackrel{@}{=} O \stackrel{@}{=} 2023 \text{ y}_{2}$ Chairman of the EMC of the University \mathcal{H}_{α} and \mathcal{H}_{α} have based

The educational program was approved at the meeting of the Academic Council of KazNARU Protocol $N_{2}/(_{-}, \langle 0 \rangle) = 0.23$ y.

Agreed with: Dean of the Faculty

Head of the Department

Assoc.professor

Master student

Graduate of 2022 year

Employers: /Head of the RSU "Balkash-Alakol basin Inspection"

Agreed with: Head of the Educational Programs Design Department

Head of training Department

Head of the Practice and Employment Sector

Deputy Head of the Department of Design of Educational Programs

T.Kerteshev

Ye.Zhaparkulova

۲

Ye.Kaipbayev

A.Rustemova

D. Duyshenuly

loce

R.Imanbet

Zh. Kussainova

A.Koishibayev

B.Yesimova

Ruch-

Sh.Kapar

Application

It is intended for the training of masters in the modular educational program 7M08601-"Water resources management using IT-technologies" in NAO "Kazakh national agrarian research university»

Regulations

«On Education» The Law of the Republic of Kazakhstan dated 27 July, 2007 No. 319-III; Order of the Minister of Science and Higher Education of the Republic of Kazakhstan dated July 20, 2022 №2;

Classifier of training programs for personnel with higher and post-graduate education. Order of the Minister of Education and Science of the Republic of Kazakhstan of October 13, 2018 No. 569;

Standard Rules for the activities of educational organizations implementing educational programs of higher and (or) postgraduate education. Order of the Minister of Education and Science of the Republic of Kazakhstan of October 30, 2018 No. 595;

Rules of the organization of the educational process on credit technology of training. Order of the Minister of Education and Science of the Republic of Kazakhstan dated 12.10.2018 No. 563;

Algorithm of inclusion and exclusion of educational programs in the Register of educational programs of higher and postgraduate education. Order of the Minister of Education and Science of the Republic of Kazakhstan No. 665 dated December 4, 2018;

Order No. 106 of the Minister of Science and Higher Education of the Republic of Kazakhstan dated October 12, 2022. Rules for keeping the register of educational programs, implemented by the organizations of higher and (or) postgraduate education, as well as the grounds for inclusion in the register of educational programs and exclusion from it.

Professional standard: "Water supply, wastewater disposal and protection of water resources" Appendix N_{2} 6 to the order of the Deputy Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" dated 11.12.2018, N_{2} 263.

Professional standard: "Hydraulic reclamation" Appendix № 7 to the order of the Deputy Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" from 26.12.2019 № 339.

Professional standard: "Construction of dams and dikes" Appendix № 9 to the order of the Deputy Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" from 26.12.2019 № 262.

Professional standard "Operation of water supply and sanitation systems" Annex № 21 to the order of the Deputy Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" from 26.12.2019 № 262.

Professional standard: "Pasture watering" Appendix No. 3 to the order of the Deputy Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan" Atameken No. 26.12.2019.

Professional standard: "Design and operation of water supply and drainage networks" Annex № 6 to the order of the Deputy Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" from 26.12.2019 № 263

Professional standard: "Design and operation of reservoirs of seasonal regulation" Annex N_{2} 7 to the order of the Deputy Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" from 26.12.2019 N_{2} 339.

Professional standard "Design and operation of river water intake structures" Appendix № 8 to the order of the Deputy Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" from 26.12.2019 № 263.

Professional standard: "Design and operation of collector-drainage network for hydromelioration systems" Appendix N_{0} 5 to the order of the Deputy Chairman of the Board of the National Chamber of Entrepreneurs of the Republic of Kazakhstan "Atameken" from 26.12.2019 No 263.

1. Passport of the educational program

Education area code and classification	7M08 Agriculture and bioresources
Code and classification of training areas	7M086-Water resources and water use
Code and name of the educational program	7M08601- Water resources management using IT-
	technologies
Type of educational program	active
The purpose of the educational program	Training of scientific and scientific-pedagogical person-
	nel for universities and scientific organizations with in-
	depth scientific-pedagogical and research training to
	improve the efficiency of water resources management
	using IT technologies
A-level ISCED	7
The level on the NOF	7
Level by ORC	7
Number of the application to the license for	KZ42LAA00006720
the direction of training	№10 from July 05, 2019
Accreditation	Certificate №1920 KE0132
The name of the accreditation body	KazSEE
The period of validity of accreditation	13.12.2019 -12.12.2024
Degree awarded	Master of Agricultural Sciences under the educational
	program «7M08601- Water resources management us-
	ing IT-technologies»
Field of professional activity	Independent activity to solve practical problems that
	require independent analysis of the situation and its
	changes.
	Participation in the management of tasks within the unit.
	Responsibility for the solution of tasks or the result of
	the activities of a group of employees or a division
Sphere and object of professional activity	Survey, design, design organizations, research institutes
Functions of professional activity	1. Solving research problems in the framework of the
r i i i i i i i i i i i i i i i i i i i	scientific (scientific - technical, innovative) project.
	2. Organization of research and (or) development in the
	framework of scientific (scientific-technical, innovative)
	projects.
	3. Organization of research and (or) development be-
	yond the main scientific (scientific and technical) spe-
	cialization, in new and (or) promising scientific areas
	with broad professional and social interaction.
Types of professional activity	1. Project-technological:
	- measurement and evaluation of the parameters of the
	industrial microclimate, the level of dust and gas, noise,
	vibration, illumination of workplaces;
	- calculation and design of industrial lighting, noise in-
	sulation and collective means of protection of personnel;
	- design of technological lines in compliance with the
	requirements of fire safety and security of personnel;
	- calculation and development of methods and means to
	reduce the impact of hazardous and harmful production
	factors on workers;
	- calculation and design of means to reduce vrednyh
	emissions into the environment;
	2. Organizational and management:
	- development and implementation of technological reg-
	ulations aimed at reducing the risk of industrial acci-
	dents and accidents:

	- selection and professional training of personnel of in-
	dustrial enterprises;
	- calculation of the number of personnel of labor protec-
	tion services, environment, personnel protection service
	and the population in emergency situations;
	- personnel management and facility protection in emer-
	gency situations.
	3. Research:
	- identification of harmful and hazardous factors on pro-
	duction lines;
	- monitoring of production and environmental parame-
	ters;
	- conducting research to develop methods and tools to
	improve safety in the technosphere and habitats;
	- research and development of measures to preserve bio-
	logical diversity in nature;
	- organization of work on the assessment of jobs and
	safety of potentially hazardous industries
	4. Scientific-pedagogical:
	- study of modern methods of teaching life safety disci-
	plines;
	- development of scientifically-based methods of profes-
	sional development of employees at all levels;
	- the use of innovative teaching technologies in the pro-
	cess of pedagogical activity.
To be competent	- in the field of research methodology;
	- in matters of innovative technical and technological
	production in all industries, including agriculture;
	- in the field of scientific and scientific-pedagogical
	activity in educational institutions;
	- in the implementation of scientific projects and
	research in the professional field.

2. Learning outcomes on EP

Codes	Learning outcomes
LO1	Demonstrate a broad outlook in the issues of philosophy of science, psychology and peda- gogy, use modern teaching methods
LO2	To demonstrate the ability to conduct a professional conversation in an international envi- ronment, to maintain a conversation on a wide range of scientific, technical and pedagogical issues
LO3	Apply at a professional level their knowledge, understanding and abilities in the field of or- ganizing a scientific experiment, modeling and analyzing the results obtained
LO4	Demonstrate leadership qualities in the organization and conduct of scientific research, the ability to demonstrate business qualities in modeling business decisions, the ability to effectively manage business activities
LO5	Organize monitoring of water bodies using information technologies, analyze the results, de- velop measures to improve the quality of water bodies
LO6	Choose cost-effective and environmentally friendly approaches to water resources manage- ment
LO7	Analyze the quality indicators of agricultural water supply using geoinformation technolo- gies and make decisions on the prevention and elimination of causes and consequences
LO8	Demonstrate various types of information and communication technologies in personal activ- ities: Internet resources, cloud and mobile services for searching, storing, processing, protect- ing and distributing information
LO9	Interpret information in the field of programming, mathematical modeling, analysis and syn- thesis, strive for continuous improvement of the level of theoretical knowledge in the use, protection and management of water resources
LO10	Conduct research work in accordance with the individual master's work plan approved by the university
L011	Conduct laboratory and experimental tests under the guidance of a scientific consultant
LO12	Show the training skills necessary for independent continuation of further training on improving water resources management

					ts	volume in hours					Distribution of credits by courses and semes- ters				Departmen t	Form of control		
		SS	line		credi			Auditor	ium		Extracu	ırricula	1 co	urse	2 co	urse		
N⊵	UC/ EC	Module name	Code of discip	The name of the discipline forming the competence	Total in academic	Total academic hours	Lectures	Practical class	Laboratory research	Other (practice)	IWMST	IWMS	1	2	3	4		
1			Т	Theoretical training		2640	213	537	0	130	375	1385						
1.1				Core subjects cycle		1050	84	236	0	30	160	540						
1)			University component		20	600	39	131	0	30	85	315						
			including:															
1.1.1	UC	Scientific communicat	IFN 60201	History and philosophy of science	4	120	12	28			20	60	4				22	exam
1.1.2	UC	ion and organizatio	IYa 60202	Foreign language (for specif- ic purposes)	4	120		40			20	60	4				24	exam
1.1.3	UC	n of the higher	PVSh 60203	Tertiary Teaching	5	120	15	35			25	75	5				6	exam
1.1.4	UC	education	PU 60204	Managerial Psychology	4	120	12	28			20	60		4			6	exam
1.1.5	UC	process	PP 60200	Teaching Practice	3	90				30		60		3				report
2)			0	ptional Component	15	450	45	105	0	0	75	225						
				educational tra	jector	y №1 «V	Vater re	sources a	and w	ater use	»							
1.1.6	EC	Remote	IGSDZV H60205	Use of geographic information systems and remote sensing in the water industry	5	150	15	35			25	75	5				6	exam
1.1.7	EC	analysis of statistical	SMHC 60206	Statistical methods in hydrological calculations	5	150	15	35			25	75	5				6	exam
1.1.8	EC	uata	HEFICP 60209	Hydraulic engineering facilities for industry and complex purposes	5	150	15	35			25	75	5				6	exam

3. Content of the educational program «7M08601- Water resources management using IT-technologies »

				educational trajectory №2 «W	ater r	esources	manage	ement us	ing in	ıformati	on techn	ologies»					
1.1.9	EC	Demote	ESGA 60207	Engineering Surveying and Geoinformatic Applications	5	150	15	35			25	75	5			6	exam
1.1.10	EC	analysis of	RSE 60208	Remote Sensing of Environment	5	150	15	35			25	75	5			6	exam
1.1.11	EC	data	HEFICP 60209	Hydraulic engineering facili- ties for industry and complex purposes	5	150	15	35			25	75	5			6	exam
1.2			N	Major subjects cycle			129	301	0	100	215	845					
1)	EC		U	niversity component	20	640	60	140	0	0	100	300					
1.2.1	EC		Con 70302	Conflictology	4	120	12	28			20	60		4		22	exam
1.2.2	EC	Planning and	MNIVRV 60302	Methodology of scientific research into Water resources and water use	5	150	15	35			25	75		5		6	exam
1.2.3	EC	modeling	PMFE 60301	Project management in the field of entrepreneurship	7	210	21	49			35	105			7	2	exam
1.2.4	EC		MBR 70301	Modeling of business solutions	4	120	12	28			20	60		4		18	exam
2)	EC		Optional Component			690	69	161			115	345					
				educational trajectory				Vater resources and water use»									
1.2.5	EC	Manage- ment of	IWRM 70306	Integrated water resources management	5	150	15	35			25	75			5	6	exam
1.2.6	EC	water re- sources and their quality	SHP 70307	Simulation of hydraulic processes	6	180	18	42			30	90			6	6	exam
1.2.7	EC	Planning and model-	WMWQT R 70308	Water management and water quality of transboundary rivers	6	180	18	42			30	90			6	6	exam
1.2.8	EC	ing	PWAS 70309	Planning in the water and agriculture sector	6	180	18	42			30	90			6	6	exam
			educational trajectory №2 «Water resources management using information technologies»														
1.2.9	EC	Planning	HMRB 70310	Hydrological modeling of river basins	6	180	18	42			30	90			6	6	exam
1.2.10	EC	ing	WSWD 70311	Water Supply and Wastewater Disposal	6	180	18	42			30	90			6	6	exam
1.2.11	EC	Manage- ment of	WRMM 70312	Water Resources Managen- ment and Modeling	5	150	15	35			25	75			5	6	exam
1.2.12	EC	water re- sources and	ECEM 70313	Environmental chemistry and environmental microbiology	6	180	18	42			30	90			6	3	exam

	their quality																
3)		RP 60300	Research practice	10	300				100		200		3	3	4	6	report
2		MGZZh/ NIRM/R WMDS 603001	Research work of a graduate student, including internship and execution of a master's thesis	24	720				120		600	2	2	2	18	6	report
3		Additional types of training															
4			Final assessment	8	240				90		150				8		
1)	Preparation and defense of the master's thesis		8	240				90		150				8		PDMT	
	TOTAL:			120	3600	213	537	0	340	375	2135	30	30	30	30		

¹ Note:

N⁰	Department
1	Agronomy, breeding and biotechnology
2	Soil science, agrochemistry and ecology
3	Horticulture, plant protection and quarantine
4	Forestry, Hunting and Fisheries
5	Land resources and cadastre
6	Water resources and land reclamation
7	Agricultural machinery and mechanical engineering
8	"Machine Use" named after I.V.Sakharov
9	Energy saving and automation
10	IT technology and automation
11	Obstetrics, surgery and reproductive biotechnology
12	Biological safety
13	Clinical veterinary medicine
14	Microbiology, virology and immunology
15	Veterinary Sanitary Expertise and Hygiene
16	"Physiology, morphology and biochemistry" named after N.U. Bazanova
17	Accounting, auditing and finance
18	"Management and organisation of agribusiness" named after H.D. Churin
19	Law
20	Zooengineering
21	Food technology and safety
22	Social disciplines
23	Kazakh and Russian languages
24	Foreign languages
25	Physical education and sports
26	Military Department

4. Map of competence modules

Compe	Module	Basic competencies	Results of the study
tence			
CODE			
CC1	Scientific	Be competent in the	LO1, LO2, LO10
	communication and	history and theory of science; on the laws	
	organization of the	of the development of science; on the role	
	learning process in	of science in the development of society, in	
	higher education	the formulation and solution of problems,	
		in the application of methodological and	
		methodological knowledge in conducting	
		scientific research; in the actual problems	
		of modern mgner education and pedagogi-	
CC2	Pomoto analysis of	Cal science.	
CC2	statistical data	ing and monitoring of water bodies	103, 103, 107, 107, 108, 1011
	statistical data	through the use of GIS and IT technolo	L00, L011
		gias digital maps mathematical models	
		the use of information and analytical data-	
		bases computer graphics tools statistical	
		and numerical methods in hydrology and	
		the design of hydrotechnical structures	
		Professional competencies	Results of the study
CC3	Planning and	Be competent in the use of the principles	LO3, LO4, LO6,
	modeling	of analysis and the	LO9, LO10, LO12
		organization and conduct of scientific re-	
		search using modern methods of mathe-	
		matical modeling and analysis of techno-	
		logical systems.	
CC4	Water resources and	Be competent in the implementation of	LO4, LO6, LO9,
	quality management	scientific projects, research and studies on	LO11, LO12
		the hydraulics of water supply structures in	
		the professional field and management of	
		water resources and water quality of trans-	
		boundary rivers	

		Nu	mber stu	of sub died	ojects	Nu	Number of academic credits					ких	Quantity	
study	er	C	CS		AS		tice	tice				мичес Х		
Course of	Semest	UC	CC	UC	CC	Theoretical training	T heoretical training Teaching pract		NIRM	NIRM Final certificatio		Всего в акаде часа	Exam	Report
I	1	3	3			28			2		30	900	6	1
	2	1		2	1	22	3	3	2		30	900	4	3
	3			2	3	25		3	2		30	900	5	2
11	4							4	18	8	30	900		1
Tot	al	4	3	4	4	75	3	10	24	8	120	3600	15	7

N⁰	Name of discipline	Brief description of the discipline	Numbe r of	Sem ester	Emerging competencies (codes)
			credits		
1		Theoretical training	88		
1.1		Core subjects cycle	35		
1)		University component	20		
1.1.1	History and philosophy of science	It forms the culture of scientific thinking, develops ana- lytical abilities and skills of research activity, gives theoretical and practical knowledge necessary for the future scientist. It is important in an era of increasing urgent need for science and scientists. It introduces the phenomenon of science as a sub- ject of special philosophical analysis, forms knowledge about the history and theory of science; about the laws of science and the structure of scientific knowledge; about science as a profession and social institute; about the methods of conduct- ing scientific research; about the role of science in the devel- opment of society	4	1	 To be competent: organization and functioning of science; in the production of knowledge, patterns of formation and development of scientific disciplines; in the formulation and solution of problems arising in the course of research activities; in the application of methodological and methodical knowledge, scientific research, pedagogical and educational work; in writing scientific articles, abstracts, presentations at conferences, symposia.
1.1.2	Foreign language (for specific purpos- es)	The main goal of the discipline is the systematic deepening of communicative competence in the framework of international standards of foreign language education based on the further development of the skills and abilities of active proficiency in English in the professional activities of the future master of sciences. Development of a master student skills: - reading literature in English in the specialty for the receipt and transmission of scientific information; - registration of the extracted information in the form of translations, annotations, abstracts; - conducting conversations in English on topics related to the specialty and scientific work of the master's program stu- dent.	4	1	<i>To be competent:</i> - work with lexicographic sources in a foreign language (traditional and on-line).

Information about the disciplines

1.1.3	Tertiary	The course considers pedagogical science and its place in the	5	1	To be competent:	
	Teaching	system of human sciences, the modern paradigm of education,			- solving problems of higher pedagogical	
		the system of higher education in Kazakhstan, upbringing and			education and prospects for its further de-	
		formation of the personality of a specialist, management in			velopment;	
		education. It gives an idea of the methodology of pedagogical			- questions of the use of effective university	
		science, methods and forms of education. Contributes to the			technology education;	
		disclosure of professional and communicative competence of			- the main types of pedagogical communica-	
		the teacher. Forms knowledge about the theory of education,			tive interaction;	
		the content of education, the organization of the learning			- solving actual psychological and pedagog-	
		process, the organization of the SRS, ideas about new			ical problems, evaluating the achieved re-	
		educational technologies, technology of training materials.			sults;	
		Develops ideas about the theory of scientific activity,			- organization and management of students.	
		NIRS(SHRS).				
1.1.4	Managerial	Discipline examines the subject, nature, tasks and structure of	4	2	To be competent:	
	Psychology	management psychology, methods of psychological research			-formation of students' need for knowledge	
		and basic approaches to its study. Examines the psychology of			and skills of a managerial nature and profes-	
		the subject of management, the psychology of cognitive activ-			sionally important qualities of future spe-	
		ity, perceptual, mnemic, thought processes in management.			cialists;	
		The course forms ideas about etiquette in the activity of a			- formation of students' understanding of the	
		modern business person, communicative competence of a			basics of management;	
		manager, emotional and volitional states in management ac-			-the development of independence in the	
		tivities and admity to manage activities.			search for information;	
					-the use of adequate methods of personality	
					research;	
					-practical use of the obtained psychological	
					knowledge in various conditions of man-	
115	Teaching Prec	Pedagogical practice is carried out in order to form practical	3	2	agement. To be competent:	
1.1.5	tice	skills of teaching and learning methods. At the same time un-	5	~	- in current problems of modern higher edu-	
		dergraduates are involved in conducting classes in the backe-			cation and pedagogical science.	
		lor's degree			- In the socio-psychological nature of educa-	
					tional activities;	
2)	Optional		15*			
,	Component					
	educational trajectory №1 «Rational use and protection of water resources»					

1.1.6	Use of geographic information systems and remote sensing in the water industry	The discipline studies methods of monitoring monitoring of water bodies through the use of GIS and IT technologies, digi- tal maps, mathematical models.	5	1	 To be competent: -geographic information systems and remote sensing in the water sector; - in the implementation of scientific projects and independent organization; - conducting research in the field of integrated water resources management;
1.1.7	Statistical methods in hydrological calculations	The objectives of the course are to study statistical and numerical methods in hydrology, the use of information and analytical databases. Modern methods for determining average monthly expenses: determination of annual and intra- annual water runoff, as well as statistical methods of water consumption of surface and subsurface runoff.	5	1	 <i>To be competent:</i> in the analysis of hydrological data; the practical use of statistical methods in hydrological calculations.
1.1.8	Hydraulic engineering facilities for industry and complex purposes	In the course of the study of the discipline, the methods of designing structures, the basics of the theory of filtration, the hydromechanical assessment of the hydrotechnical method of forming hydraulic structures, the placement of river basins and the design methods of structures for flood protection in the reservoir are studied.	5	1	 <i>To be competent:</i> during the inspection of hydraulic structures; in the design of water intake waterworks.
	educational traje	ectory №2 «Water resources management using information t	echnologi	es»	
1.1.9	Engineering- geodetic and geoinformation programs	The use of GIS in agriculture, forestry and water management. Information support for consumers. Remote and satellite mon- itoring methods. Technologies for the use of GIS in the water sector. Database management systems (DBMS). Global Posi- tioning Systems (GPS). Methods of analysis and decryption of geoinformation. Mapping systems. Methods of digital image processing. Cartographic graphics. The functionality of mod- ern GIS.	5	1	 To be competent: -geographic information systems and remote sensing in the water sector; - in the implementation of scientific projects and independent organization; - conducting research in the field of integrated water resources management;
1.1.10	Remote Sensing of Environment	Within the framework of this discipline, methods of organization and technical support of information and analytical monitoring of the natural environment for various areas of economic activity are studied. GIS technologies will also be used to monitor and study water bodies.	5	1	To be competent:- Ability to independently carry out research activities in the relevant professional field using modern research methods and information and communication technologies;- Ability to generalize research results for

					their practical application in economic activities
1.1.11	Hydraulic engineering facilities for industry and complex purposes	In the course of the study of the discipline, the methods of designing structures, the basics of the theory of filtration, the hydromechanical assessment of the hydrotechnical method of forming hydraulic structures, the placement of river basins and the design methods of structures for flood protection in the reservoir are studied.	5	1	To be competent: - during the inspection of hydraulic structures; - in the design of water intake waterworks.
1.2		Cycle of profile disciplines			
1.2		University component:	<u> </u>		
1.2.1	Conflictology	Discipline examines the main categories of conflictology, the typology of conflict technology conflict management. The course studies theories of the behavior of an individual in a conflict, the technologies of effective communication and ra- tional behavior in a conflict. Forms an understanding of the psychology of the negotiation process on conflict resolution, mediation as a technology for conflict resolution. Also con- siders conflicts in society, conflicts in organizations, conflicts and stress.	4	2	 To be competent: diagnosing and preventing conflicts. the use of basic methods and technologies for the prevention and resolution of conflicts; using the principles of analysis and management of organizational conflicts; possession of various ways of resolving conflict situations on the basis of modern personnel management technologies.
1.2.2	Methodology of scientific research into Water resources and water use	Methodology of theoretical and experimental research in the field of water resources management. Analysis of theoretical and experimental studies and formulation of conclusions and proposals. Introduction and effectiveness of scientific research. General requirements and rules for the design of research work. General requirements for research work.	5	2	 To be competent: in the implementation of scientific projects; independent organization of scientific projects; conducting research in the field of water resources management.
1.2.3	Project management in the field of entrepreneurship	Subjects of entrepreneurial legal relations, an entrepreneur. Entrepreneurship. Initiative activity of citizens and legal enti- ties, Obtaining a net income by meeting the demand for goods. Private property, the principles of recognition of vari- ous forms of ownership, maintaining competition.	7	3	<i>To be competent:</i> - to understand the social importance of business activity, to make management decisions and to bear responsibility for them; - to use innovative technologies in business activity, search and process information

					necessary for solving professional tasks; - plan and implement entrepreneurial ideas, based on professional and personal development.
1.2.4	Modeling of business solutions	Acquaintance with the decision-making process, starting from formalization of the initial problem, through building and solving a mathematical model on a computer to analyzing the decision and forming a management decision. Formation of skills in the construction and solution of mathematical models and analysis of these solutions on a computer. Consideration of production, transport and financial models of tasks for the choice of management decisions.	4	2	<i>To be competent:</i> able to independently conduct research using modern methods of mathematical modeling and analysis of the results of a scientific experiment
2)		Optional component:	23*		
№1 «R	ational use and pr	otection of water resources»			-
1.2.5	Integrated water resources management	Principles, planning and national plan for integrated water resources management. Improvement and harmonization of water legislation in the field of water resources management. Implementation of the environmental component integrated water resources management and water quality management.	5	3	 <i>To be competent:</i> in matters of modern educational technologies; in the implementation of scientific projects and independent organization and conduct of research in the field of integrated water resources management.
1.2.6	Simulation of hydraulic processes	The essence of modeling is that the model of smaller and sometimes larger scale creates a hydraulic phenomenon, like the phenomenon that takes place or should occur in nature, which allows you to study this phenomenon	6	3	 <i>To be competent:</i> in matters of modern trends and methods of planning in the field of water and agriculture technologies; - in the implementation of scientific projects, research and calculations on the hydraulics of water facilities in the professional field.
1.2.7	Water management and water quality of transboundary rivers	Improving water resources management and transboundary water cooperation in Central Asia. Principles of international cooperation in the use and protection of transboundary waters. Settlement of disputes on the use and protection of trans- boundary waters.	6	3	<i>To be competent:</i> - water management and water quality of transboundary rivers; - carrying out reconstruction of basin schemes of water regulation and water distribution.

1.2.8	Planning in the water and agriculture sector	Strategic planning of water resources use and protection. State planning in the field of water resources use and protection. Principles of ecosystem (basin) prosperity of the Republic of Kazakhstan. The pattern of usage of water resources protection. Long-term planning and operational decision- making in the prosperity and conservation of water resources. Integrated water resources management. The main directions of water policy.	6	3	<i>To be competent:</i> - planning in the water and agriculture sector - in matters of modern trends and methods of planning in the field of water and agriculture technologies;		
	educational trajectory №2 «Water resources management using information technologies»						
1.2.9	Hydrological modeling of river basins	Patterns of flow formation in river basins. Types and structure of hydrological models for describing the processes of the hydrological cycle in river basins at various spatial and temporal scales. Hydrographic modeling of river basins at various spatial scales using IT technology. Modeling of flow formation in river basins using IT technology. Methodological approaches to the spatial-temporal analysis of the fields of characteristics of the hydrological cycle of the land for large river basins using the results of modeling hydrological processes in the problems of applied hydrology.	6	3	<i>To be competent:</i> - in the analysis of hydrological data; - the practical use of statistical methods in hydrological calculations.		
1.2.10	Water Supply and Wastewater Disposal	Water supply and wastewater disposal are the most efficient systems and schemes for water supply and sewage, classification of water intake structures from surface and underground sources, design and research of water supply systems, research of water supply and drainage pumping stations.	6	3	 <i>To be competent:</i> in matters of modern trends and methods of planning in the field of water and agriculture technologies; - in the implementation of scientific projects, research and calculations on the hydraulics of water facilities in the professional field. 		
1.2.11	Water Resources Managenment and Modeling	When studying the discipline, remote sensing methods, elec- tronic maps are used, and undergraduates also get acquainted with experimental research using simulating mathematical models. Mapping as a system modeling of water resources.	5	3	<i>To be competent:</i> - water management and water quality of transboundary rivers; - carrying out reconstruction of basin schemes of water regulation and water distribution.		
1.2.12	Environmental chemistry and	The goal of mastering is to form students' ideas about the practical application of biological knowledge as the scientific	6	3	<i>To be competent:</i> -in the structure and basic principles in the		

	environmental microbiology	basis of individual branches of modern production, environ- mental management and the foundation of ecology. Discipline will give knowledge about the fundamental laws of the func- tioning and development of living systems, the main direc- tions of the use of the achievements of plant growing and an- imal husbandry in ecology, and on current problems of bio- logical safety and bio-protection in agricultural production.			field of waste disposal of agricultural enterprises; - in the legal, regulatory and organizational framework for ensuring the preservation and disposal of waste at economic facilities; -in conducting an oring monitor for the utilization of waste and the preservation of the biological diversity of the environment.
3)	Research practice	The research practice of a master's student is conducted in or- der to get acquainted with the latest theoretical, methodologi- cal and technological achievements of domestic and foreign science, modern methods of scientific research, processing and interpretation of experimental data.	10	2, 3	<i>To be competent:</i> - the ability to use skills in the organization of research and scientific work; - the ability to independently learn new re- search methods, to use the methods of sci- ence in professional activity
2	Research work		24		
1)	Research work of the undergraduate, including the passage of training and the implementation of the master's thesis	The purpose of RWMS is to provide undergraduates with primary professional skills in organizing, conducting and presenting the results of research work.	24	1, 2, 3, 4	<i>To be competent:</i> - The ability to organize their work on a sci- entific basis, independently evaluate the re- sults of their activities, possess the skills of independent work in the field of conducting scientific research - Ability to generalize, analyze, critically comprehend, systematize, and predict when setting goals in the field of professional ac- tivity
3	Additional				
	types of training				
4	Final		8		
	assessment				
1)	Registration and defense of the master's thesis		8	4	
	TOTAL:		120		

N⁰	Name of companies, enterprises, or-	Contacts
	ganizations	Tel, e-mail
1	LLP "Institute of Geography"	Almaty, Kabanbai Batyr/Pushkina 67/99
2	GU "Kazselezashchita" of the Minis-	Almaty, Kaldayakov str., 70, +7(727) 2912755
	try of Emergency Situations of the	
	Republic of Kazakhstan	
3	D. Kunaev TANK RSE "Kazvod-	Almaty region, ul. Melioratornaya, 1A 8 (72737)
	khoz"	1 80 00
4	Design Institute of PC "Kazgiprovod-	Almaty, 434 Seifullin Ave., 8 (727) 2793522
	khoz"	
5	GKP "Almaty Su"	Almaty, 196 Zharokov str., 8 (727)2276001
6	Branch of RSE on PVC "Kazhydrom-	Almaty, 32 Abay Ave. 8 (727)2676464
	et" Ministry of Energy of the Republic	
7	of Kazakhstan	
1	East Kazakhstan branch of RSE	Ust-Kamenogorsk, Kazakhstan str., 99/1
0	"Kazvodknoz"	$V_{\text{constants}} = T_{\text{cl}} + \frac{1}{2} + 1$
8	Kyzylorda branch of KSE Kazvod-	Kyzylorda, 10le bl str., 66, 8 (7242) 233250
0	AIIUZ AVA IVIAUITAA	Zhambul ragion Taraz Zhaugaah Datur atu 1a
9	khoz" KVR of the Ministry of Agri-	2 (7262) $A25490$
	culture of the Republic of Kazakhstan	0 (7202) 423490
10	Turkestan branch of RSF "Kazvod-	Shymkent Mukhamed Haidar Dulati str. 5
10	khoz" KVR MAGiPR RK	8 (7252) 54 87 37
11	RSU Aralo-Syrdarya BVI KVR	Kyzylorda Amangeldy str. 107. 8
	MAGIPR RK	(7242)235607
12	Balkhash-Alakol BVI KVR MAGiPR	Almaty, Abylai Khan Aye., 2, 8 (7272)453253
	RK	
13	MAEKKazatomprom LLP	West Kazakhstan region, Mangystau region, Ak-
		tau
		8 (7292)564208
14	" Zonal hydrogeological and reclama-	Almaty, Zhetysu district, 113 Baisheva Street
	tion center»	8 (727) 264 26 29
15	State enterprise "Kostanay Su»	Kostanay region, Kostanay, Abay street 19
		8(7142)222500
16	LLP "Design Institute named after Zh.	Almaty region, Taldykorgan, D. Konaev str., 20
	R. Dzhanekenov"	
17	LLP "Water resources-Marketing"	Shymkent, G. Ormanov str., 17, 8 (7252) 321 195
18	Panfilov production site of the Almatv	Almaty region, Zharkent, Golovatskogo str
	branch of the RSE "Kazvodkhoz"	290, 8 (72831) 9 40 12
	KVR MAGiPR RK	
19	RSE " Kazvodkhoz»KVR MAGiPR	Nur-Sultan, Pushkin street, 25, 8 (7172) 24 85
	RK	26
20	SCC " Taza Su-2014»	Zhambyl region, T. Ryskulov district, Kulan vil-
		lage, K. Asylov str., 54
21	GKP " Alakolirrigation»	Almaty region, Alakol district, Usharal, V.
		Toshchenko str., 19, 8 (72833) 3 52 71
22	GKP "Turkestan-Su"	Turkestan region, Turkestan, S. Erubayev str.,
		255, 8 (72533) 4 21 92
23	Kegens district " Department of Hous-	Almaty region, Kegen region, Kegen village, B.
	ing and Communal Services and hous-	Momyshuly str., 9, 8 (7277) 721475
	ing Inspection»	

24	KGP "Ayagoz Su"	East Kazakhstan region, Ayagoz, 61 Barak batyr str., 8(7223)730301
25	«Uralvodproekt» LLP	WKO, Uralsk, ul. Hamid Churin, 119, 8 (7252) 535057
26	Kyzylorda branch of RSE "Kazalysu- shar»	Kyzylorda region, Kazalinsky district, Aiteke bi str., 1, 8 (724) 3851687
27	GKP " Kapshagai Su Arnasy»	Almaty region, Kapchagai, Koichumanov street, 4, 8 (72772) 4 19 48
28	KGP "Balkhash Su»	Karaganda region, Balkhash, Sabitova MKR, 18b, 8 (71036) 65490