Mining and Metallurgical Institute named after O.A. Baikonurov
«Mine Surveying and Geodesy» department

EDUCATIONAL PROGRAM
7M07324 - «Land management»

Code and classification of the field of education: 7M07 Engineering, Manufacturing and Civil engineering
Code and classification of training areas: 7M073 Architecture and Civil engineering
Group of educational programs: M128 Land Management
Level based on NQF: 7
Level based on IQF: 7
Study period: 2 years
Amount of credits: 120

Almaty 2024

Educational program 7M07324 - «Land management» was approved at a meeting of the Academic Council of KazNRTU named after K.I.Satpayev.
Protocol № 6 of 19.04.2024
Considered and recommended for approval at a meeting of the Educational and Methodological Council of KazNRTU named after K.I.Satpayev.
Protocol № 12 of 22.04.2024

Educational program 7M07324 - «Land management» developed by the academic committee in the direction of «Land management»

Full name	Academic degree/ academic title	Position	Place of work	Signature
Academic staff:				
Orynbasarova E.O.	PhD	head of department	SU	
Aitkazinova Sh.K.	PhD	Associate Professor	SU	
Kenesbayeva A.	PhD	senior lecturer	SU	
Employer:				
Aymenov A.T.		Chief Engineer	Republican Cartographic Factory	
student:				
Kenzhegulova A.E.		1st year master`s student		

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List of abbreviations and designations

Reduction	Full name
ECTS	European Credit Transfer and Accumulation System
NJSC SU	NJSC Satbayev university
MES RK	Ministry of Education and Science of the Republic of Kazakhstan
TS	Teaching staff
EP	Educational program
RO	Registrar's Office
WC of the EP	Working curriculum of the EP

1. Description of the educational program

Land management is a system of measures to ensure compliance with the land legislation of the Republic of Kazakhstan aimed at regulating land relations, organizing the rational use and protection of land.

2. The purpose and objectives of the educational program

Goal EP: training of highly qualified scientific, technical and engineering personnel, whose activities are aimed at solving complex problems in the field of land management, cadastre and land and property relations, capable of carrying out various design, production, technological, organizational and managerial activities at a high technical level in the public and private sector, in organizations of any form of ownership.

Tasks EP:

Task 1: The readiness of specialists for research and design work in the field of geodesy, cartography, geoinformatics, surveying and land management, including in related fields related to the selection of necessary research methods, modification of existing and development of new methods based on the objectives of a specific study.

Task 2: The readiness of specialists for production and technological activities that ensure the introduction of new digital developments at the local level.

Task 3: The readiness of specialists to search for and obtain new information necessary to solve professional tasks in the field of knowledge integration in relation to their field of activity, to actively participate in the activities of an enterprise or organization.

Task 4: The readiness of specialists for scientific, informational, ideological and problematic communications in the professional environment and in the audience of non-specialists with a clear and deep justification of their position, to engage in organizational, managerial and service activities, to be aware of the responsibility for making their professional decisions.

Task 5: The readiness of specialists for self-study and continuous professional development during the entire period of scientific or professional activity.

3. Requirements for the evaluation of learning outcomes of the educational program

Learning outcomes include knowledge, skills and competencies and are defined both for the general education program and for its individual modules, disciplines or tasks.

The main task at this stage is to choose methods and means of evaluation for all types of control, with the help of which it is possible to effectively assess the achievement of the planned learning outcomes at the subject level.

4. Passport of the educational program

4.1. General information

№	Field name	Note
1	Code and classification of the field of education	7M07 Engineering, Manufacturing and Civil engineering
2	Code and classification of training directions	7M073 Architecture and Civil engineering
3	Educational program group	M128 Land management
4	Educational program name	7M07324 Land management
5	Short description of educational program	Land management is a system of measures to ensure compliance with the land legislation of the Republic of Kazakhstan aimed at regulating land relations, organizing the rational use and protection of land.
6	Purpose of EP	Training of highly qualified scientific, technical and engineering personnel, whose activities are aimed at solving complex problems in the field of land management, cadastre and land and property relations, capable of carrying out various design, production, technological, organizational and managerial activities at a high technical level in the public and private sector, in organizations of any form of ownership.
7	Type of EP	New EP
8	The level based on NQF	7
9	The level based on IQF	7
10	Distinctive features of EP	No
11	List of competencies of educational program	7
12	Learning outcomes of educational program	1. Apply the skills of professional functions in the land cadastre industry, the ability to manage and develop work projects in land management. 2. Apply modern computer technologies for computer-aided design of production processes in the land cadastre industry. 3. To develop projects and schemes of land management,

		schemes of territorial planning, measures to study the condition and protection of land, to monitor land. Make optimal management decisions. 4. Apply skills of working with legal and regulatory acts regulating land relations, work with technical documentation of land management design and territorial planning. 5. Be able to analyze and apply modern computer technologies, including Web-based GIS to create database management systems, analyze mathematical processing methods, the ability to show creative initiative, prepare applications for inventions and industrial designs. 6. Apply the skills to express your thoughts freely and clearly in English and use it as a means of business communication at a professional level. 7. To carry out research and pedagogical work, to raise the intellectual and general cultural level, to improve the moral and physical development of one's personality in the competence of professional activity.
13	Education form	Full-time
14	Period of training	2 years
15	Amount of credits	120
16	Languages of instruction	Kazakh, Russian
17	Academic degree awarded	Master
18	Developer(s) and authors	Department of MSaG

4.2. The relationship between the achievability of the formed learning outcomes according to the educational program and academic disciplines

№	Name of the discipline	Brief description of the discipline	Number of credits	Generated learning outcomes (codes)						
				LR1	LR2	LR3	LR4	LR5	LR6	LR7
Cycle of basic disciplines University component										
1.	Foreign language (professional)	The course is aimed at studying the main problems of scientific knowledge in the context of its historical development and philosophical understanding, the evolution of scientific theories, principles and methods of scientific research in the historical construction of scientific paintings of the world. The discipline will help to master the skills of developing critical and constructive scientific thinking based on research on the history and philosophy of science. At the end of the course, undergraduates will learn to analyze the ideological and methodological problems of science and engineering and technical activities in building Kazakhstan's science and the prospects for its development.	3						v	
2.	History and philosophy of science	The subject of philosophy of science, dynamics of science, specifics of science, science and pre-science, antiquity and the formation of theoretical science, the main stages of the historical development of science, features of classical science, non-classical and post-non-classical science,	3							v

		philosophy of mathematics, physics, engineering and technology, specifics of engineering sciences, ethics of science, social and moral responsibility of a scientist and engineer.								
3.	Higher school pedagogy	The course is aimed at mastering the methodological and theoretical foundations of higher education pedagogy. The discipline will help to master the skills of modern pedagogical technologies, technologies of pedagogical design, organization and control in higher education, skills of communicative competence. At the end of the course, undergraduates learn how to organize and conduct various forms of organizing training, apply active teaching methods, and select the content of training sessions. Organize the educational process on the basis of credit technology of education.	3							**v**

4.	Management Psychology	The course is aimed at mastering the tools for effective employee management, based on knowledge of the psychological mechanisms of the manager's activity. Discipline will help you master the skills of making decisions, creating a favorable psychological climate, motivating employees, setting goals, building a team and communicating with employees. At the end of the course, undergraduates will learn how to resolve managerial conflicts, create their own image, analyze situations in the field of managerial activity, as well as negotiate, be stress-resistant and effective leaders.	3							v
Cycle of basic disciplines Elective component										
6.	Automated methods of land research	This discipline includes theoretical and practical aspects of automated methods of Earth exploration using aerospace sensing, geoinformation modeling, integration of various methods for use in systematic geographical exploration of the earth and includes the following sections: methods and means of automated Earth exploration, direct, space, photomethods, combined methods and data processing	5		v			v		
7.	Visualization of geospatial data	The discipline aims to master the methods and concept of visual representation of spatial data (SD) obtained as a result of geodetic and surveying measurements for making managerial and engineering decisions and includes the following	5		v			v		

		sections: geovisualization in the context of points of view of related disciplines; geo-imaging; methods of visualization and representation of SD; interactive approaches to delineating the isosurface for geovisualization; multivariate mapping and classification; interpretation of spatial analysis results; Simulation of virtual environments ("True 3D", empirical research, VR/AR).								
8.	Spatial data infrastructure	The aim is to study the creation and development of a spatial data infrastructure that provides access to spatial data and its effective use. The study of the use of geodetic and cartographic methods in solving problems of creating databases of spatial and temporal data, environmental monitoring. The study of GIS packages, spatial data sources for solving professional tasks.	5		v			v		
8.	Monitoring of urban lands	The purpose of studying the discipline is the theoretical development of the meaning and role of urban land monitoring in the field of land and natural resources management, land management and cadastral works, interaction of information systems of land cadastre and land monitoring and includes the following sections: characteristics of urban lands and their features as an object of assessment and monitoring; basic methods of monitoring urban lands; organization of observations monitoring the condition and use of the land fund; remote methods of land monitoring; using remote sensing data for	5					v		v

		urban land planning.								
9.	Organization of scientific research	The discipline is aimed at introducing undergraduates to scientific knowledge, willingness and ability to conduct research activities in the field of land management and cadastre related to the selection of necessary research methods, conducting experimental research and analyzing their results using information technology, conducting research based on modern achievements of domestic and foreign scientists and opens the way to the introduction of new developments	5			v				
10.	Territorial planning and management	The study of the discipline is to ensure sustainable and balanced development of territories, including the development of engineering, transport, and social infrastructure based on respect for the interests of citizens and the state. Undergraduates should gain theoretical knowledge about the spatial organization of territories and the formation of the territorial environment and master the methods of studying the existing spatial structure for making decisions on planning and managing the development of territories.	5			v				
11.	Intellectual property and research	The purpose of this course is to provide undergraduates with the knowledge and skills necessary to understand, protect and manage intellectual property (IP) in the context of scientific research and innovation. The course is aimed at training specialists who can effectively work with IP, protect the results of scientific research and	5							

		apply them in practice								
12.	Sustainable development strategies	To train graduate students in sustainable development strategies to achieve a balance between economic growth, social responsibility, and environmental protection. Graduate students will study the concepts and principles of sustainable development, the development and implementation of sustainable development strategies, the evaluation of their effectiveness, and international standards and best practices. Cases and examples of successful sustainable development strategies are included.	5							
Cycle of profile disciplines University component										
13.	Urban development and planning	The course program is aimed at acquiring skills in territorial strategic planning and territorial development. The ability to effectively make management decisions in the organization and development of a territory, the use of a comprehensive analysis of territories, using modern geoinformation technologies to predict the development of territories, the development of planning documentation and management of administrative-territorial units.	5	**v**		**v**				
14.	Land management expertise	The program of the discipline is aimed at acquiring the skills of land management expertise, as a mandatory element in the system of land management and real estate. Master students will study methods for determining the characteristics of land plots, determining the actual location and actual	5	**v**		**v**				

		area of land plots, as well as other issues related to land plots.								
15.	Land management and land management design	The discipline aims to form the skills of undergraduates in organizing and conducting land management activities, planning and rational use of the land fund of the Republic of Kazakhstan. Principles of making schemes and plans, measures for streamlining boundaries, formation of land use, the order of work in inter-farm and on-farm land management, as well as a comprehensive approach to the development of land management projects will be studied.	5	v		v	v			
16.	Legal support of land management activities	The discipline aims to form the skills of undergraduates in organizing and conducting land management activities, planning and rational use of the land fund of the Republic of Kazakhstan. Principles of making schemes and plans, measures for streamlining boundaries, formation of land use, the order of work in inter-farm and on-farm land management, as well as a comprehensive approach to the development of land management projects will be studied.	5	v			v			
17.	Spatial analysis	Is to train undergraduates in methods of analysis and interpretation of spatial data using modern tools of geoinformatics and statistics. The discipline "Spatial Analysis" includes the study of methods for analyzing geographic data, visualization, statistics of spatial data, spatial modeling, the application of GIS in various fields and the acquisition of practical skills in working with software tools for analyzing spatial	5					v		v

		data.								
18.	Land use regulation and land economy	The study of the discipline consists in the formation of competencies in the tasks of land management, principles and systems of management of authorities, legislation and legal procedures related to the regulation of land use. Knowledge of the relationship between public sector planning and regulation and the economics of land and property. The undergraduate must be able to assess the role of the public sector in the land economy.	5	v			v			
19.	Modern problems of land management and cadastre	The course will present modern methods and methods of land management and organization of the use of a single land fund at various administrative and territorial levels, at enterprises and organizations of various branches of the national economic complex, receipt, collection and processing in the management of the cadastre.	5			v				v
20.	Territorial land use planning	The aim of the course "Territorial planning and management" is to develop master students' knowledge, skills and ideas necessary to solve problems in the spatial organization of the territory and the formation of planning projects for territorial units for the effective application of the acquired skills in practical activities. The ability to effectively make management decisions in the organization and development of a territory, the use of a comprehensive analysis of territories.	5			v	v			
21	Remote sensing of the Earth and natural	The study of the theoretical foundations and practical skills of observing the Earth's	4							

	resources	surface by ground and remote methods. Formation of remote sensing data processing skills using modern software, classification and interpretation of the results obtained, correct design of the results and preparation of accounting documentation.								
Cycle of profile disciplines Component of choice										
21.	Land management with the use of WEB-GIS	The purpose of mastering the discipline "Land management with the use of WEB-GIS" with the use of WEB-GIS is to form a holistic view of land use management in modern conditions, knowledge of the scientific and theoretical foundations of land use management in the amount provided for in the curriculum and necessary for solving production and research tasks using WEB-GIS technologies.	5			**v**		**v**		
22.	WEB-GIS	The study of theoretical and practical aspects of web GIS. Formation of ideas and understandings about the concepts and technical foundations of web GIS; exploring the possibilities of web GIS technologies using ESRI products (ArcGIS online, server) and open resources (QGIS, Mapserver, Geoserver); geospatial web services, geoportals, meshes, mobile GIS, creating interactive online maps for solving problems in the field of geodesy, cartography, surveying.	5			**v**		**v**		

5. Curriculum of the educational program

KAZAKH NATIONAL RESEARCH TECHNICAL UNIVERSITY named after K.I.SATPAYEV

SATBAYEV UNIVERSITY

APPROVED
Chairman of the Management Board-
Rector of KazNRTU named after K.Satpaye
M.M. Begentaev
«23» 07 2024 y.

CURRICULUM
of Educational Program on enrollment for 2024-2025 academic year
Educational program 7M07324 - "Land management"
Group of educational programs M128 - "Land management"

Form of study: full-time **Duration of study: 2 year** **Academic degree: Master of Technical Sciences**

Discipline code	Name of disciplines	Cycle	Total amount in credits	Total hours	Classroom amount lec/lab/pr	SIS (including TSIS) in hours	Form of control	Allocation of face-to-face training based on courses and semesters			
								1 course		2 course	
								1 semester	2 semester	3 semester	4 semester
CYCLE OF BASIC DISCIPLINES (BD)											
M-1. Module of basic training (university component)											
LNG210	English (professional)	BD UC	5	150	0/0/3	105	E	3			
HUM214	Management Psychology	BD UC	3	90	1/0/1	60	E	3			
HUM212	History and philosophy of science	BD UC	3	90	1/0/1	60	E		3		
HUM213	Higher school pedagogy	BD UC	3	90	1/0/1	60	E		3		
component of choice											
MAP718	Organization of scientific research	BD CCH	5	150	1/0/2	105	Э	5			
MNG782	Sustainable development strategies	BD CCH			2/0/1						
MAP293	Automated methods of land research	BD CCH			2/0/1						
MAP277	Territorial planning and management	BD CCH	5	150	1/0/2	105	Э	5			
MNG781	Intellectual property and research	BD CCH			2/0/1						
MAP719	Geospatial data visualization	BD CCH			1/0/2						
MAP713	Spatial data infrastructure	BD CCH	5	150	1/0/2	105	Э			5	
MAP214	Monitoring of urban land	BD CCH			2/0/1						
CYCLE OF PROFILE DISCIPLINES (PD)											
M-2. Module of professional activity (university component, component of choice)											
MAP276	Land use regulation and land economy	PD	5	150	1/0/2	105	Э	5			
MAP282	Land management expertise	PD	5	150	1/0/2	105	Э	5			
MAP703	Modern problems of land management and cadastre	PD	5	150	1/0/2	105	Э		5		
MAP257	Territorial land use planning	PD	5	150	2/0/1	105	Э		5		
MAP278	Urban development and planning	PD	5	150	2/0/1	105	Э			5	
MAP716	Spatial analysis	PD	5	150	1/0/2	105	Э		5		
MAP722	Legal support for land management activities	PD	5	150	2/0/1	105	Э		5		
MAP292	Land management and land management design	PD	5	150	2/0/1	105	Э			5	
MAP265	Remote sensing of the Earth and natural resources	PD	4	120	1/0/2	75	Э			4	
MAP710	WEB-GIS	PD	5	150	1/0/2	105	Э			5	
MAP712	Land management using WEB-GIS				1/0/2						
M-3. Practice-oriented module											
AAP229	Pedagogical practice	BD UC	8					8			
AAP256	Research practice	PD, CCH	4								4
M-4. Experimental research module											
AAP272	Research work of a master's student, including internship and completion of a master's thesis	RWMS UC	4					4			
AAP268	Research work of a master's student, including internship and completion of a master's thesis	RWMS UC	4						4		
AAP254	Research work of a master's student, including internship and completion of a master's thesis	RWMS UC	2							2	
AAP255	Research work of a master's student, including internship and completion of a master's thesis	RWMS UC	14								14
M-5. Module of final attestation											
ECA212	Preparation and defense of a master's thesis	FA	8								8
Total based on UNIVERSITY:								30	30	34	26
								60		60	

Number of credits for the entire period of study	
Cycles of disciplines	Credits

Cycle code			university component (UC)	component of choice (CCH)	Total
BD	Cycle of basic disciplines		20	15	35
PD	Cycle of profile disciplines				53
	Total for theoretical training:	*0*	*20*	*15*	*88*
	RWMS				*24*
FA	Final attestation	8			8
	TOTAL:	**8**	**20**	**15**	**120**

Decision of the Academic Council of KazNRTU named after K.Satpayev. Protocol № 12 от "20" 04 2024.

Decision of the Educational and Methodological Council of KazNRTU named after K.Satpayev. Protocol № 6 от "19" 04 2024 y.

Decision of the Academic Council of the Institute_____. Protocol № 8 от "17" 04 2024.

Vice-Rector for Academic Affairs — **R.K.Uskenbayeva**

Director Mining and Metallurgical Institute named after O. Baikonurov — **K.B. Rysbekov**

Head of the Department " Mine surveying and geodesy" — **E. O. Orynbassarova**

Specialty Council representative from employers — **A.T.Aimenov**