

APPROVED:

Candidate of Technical Sciences,  
Director of «GEO TRACK»

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CATALOG OF DISCIPLINES OF THE COMPONENT BY CHOICE

EDUCATIONAL PROGRAM

6B07331 – Cadastre and urban planning

Education level: Bachelor's degree Duration of study: 4-year Year of admission: 2023

Module	Cycle	Component	Name of the discipline	Total labor		Term	intensity Semester Results of training of training	Short description	of the discipline	Prerequisites	Post requirements Department
				academic hours	academic credits						
1	2	3	4	5	6	7	8	9	10	11	12
Module 1- Natural Sciences disciplines	GED	KV	Ecology and life safety	150	5	3	LO4	Study of basic environmental concepts, environmental problems and approaches to their solution, sources and types of environmental pollution by enterprises, principles of standardization of air and water quality, basic provisions of legislation in various fields, natural and man-made emergencies, their causes, methods of prevention and protection. Teaching methods - analysis of specific situations (case-study).	Engineering mathematics applied Physics Basics of computer modeling	Introduction to the design of transport infrastructure facilities Construction of bridges and pipes Strength of materials Engineering mechanics 2	ATS BGD
			Scientific Research Methods				LO3	Students obtain theoretical and applied knowledge on methods of scientific research of problems in the field of study, train specialists with skills of cognitive activity in the field of science, formulate deep ideas about the content of scientific activity, its methods and forms of knowledge.			



the SRSIFV Module 2- Withsocial and political knowledge			Fundamentals of Economics and Entrepreneurship	18	6	3	LO4	Studies the activities of enterprises in various types of markets, the model of equilibrium and functioning of the market, government regulation of prices and tariffs. Examines the concept of entrepreneurship and the limits of its legal regulation, conditions for the development of entrepreneurship, organizational and legal forms of doing business, business planning, business secrets, social responsibility of entrepreneurship. Active learning methods: case methods; business role-playing games, group work.	Engineering mathematics applied Physics Basics of computer modeling	Monitoring of land and real estate Territorial planning and forecasting	LMT
			Fundamentals of law and anti-corruption culture				LO1.4	Increasing the public and individual legal awareness and legal culture of students, as well as the formation of a system of knowledge and civic position to combat corruption as an antisocial phenomenon. As a result of studying the course, the student must master the fundamental concepts of law, the constitutional structure of state power of the Republic of Kazakhstan, the rights and freedoms of citizens enshrined in the Constitution, the mechanism and protection of legitimate human interests in case of their violation.	Engineering mathematics applied Physics Basics of computer modeling	Reconstruction and renovation of urban areas Management of land management and cadastral works Management in urban planning Cadastral assessment of land settlements	SRS IFV
			The engineering geodesy				LO5	Studies the composition and technology of geodetic works that provide surveys, design, construction, and operation of structures, the basic requirements for solving typical engineering and geodetic problems, and their geometric essence. Gains skills in reading a topographic map, solving on its basis relevant problems of both a graphical and mathematical calculation nature. The discipline uses interactive teaching methods.	Engineering mathematics applied Physics Basics of computer modeling	Geodetic work during cadastre maintenance Three-dimensional laser scanning for land management and cadastre purposes	SI



Module 6- Basic special disciplines				180	6	4				Real estate cadastral assessment of land settlements	
			Basics of geoinformatics				LO2	Study of general information about geographic information systems, basic terms and concepts, issues of data input and output, their digitization, methods of presenting spatial and attribute information, brief characteristics of the main GIS, their advantages and disadvantages, general ideas about GIS software, basic geoinformation technologies and techniques preparation of initial information, creation and editing of objects. The discipline uses interactive teaching methods.	Engineering mathematics applied Physics Basics of computer modeling	Three- dimensional laser scanning for land management and cadastral purposes City engineering structures Territorial planning and forecasting	SI
	BD	EK	Theoretical foundations of land management	LO5	180	6	4	Studies issues related to the land cadastral and technical inventory, substantiates the need for cadastral registration and maintenance of the real estate cadastral as technological stages of work preceding the registration of rights to real estate, a balance between the theoretical foundations of the cadastral, which are general scientific and independent of the current situation for the purpose of practical application in specific conditions current legislation of the Republic of Kazakhstan. The discipline includes on-site classes at a branch of the department and guest lectures by top managers.	Engineering mathematics applied Physics Basics of computer modeling The engineering geodesy Construction Materials Engineering geology and hydrogeology	Construction of 3D terrain models for land management and cadastral purposes Virtual computer modeling in architecture and urban planning Territorial planning and forecasting	SI
			Soil science								



								guest lectures by top managers.	geology and hydrogeology	transport	
BD	KV	Construction of 3D terrain models for land management and cadastre purposes	180	6	5	LO2	Forms knowledge and skills in using tools for automated construction of 3D terrain models using the example of the AutoCAD software package, designing transportation routes, the main elements of highways, airfields and airports, bridges and traffic interchanges, teaches how to work in text editors and spreadsheet editors in order to implement rational principles design of civil and transport structures. The discipline provides software training and computer modeling.	Engineering mathematics applied Physics Basics of computer modeling Digital mapping Theoretical foundations of land management Soil science Geodetic work during cadastre maintenance	Compositional modeling and animation in architecture and urban planning Virtual computer modeling in architecture and urban planning Territorial planning and forecasting Urban planning	SI	
		Three-dimensional laser scanning for land management and cadastre purposes				LO2	Forms professional competencies in the field of using a digital three-dimensional terrain model obtained from airborne laser scanning materials, which can significantly increase the reliability of detection and proactive assessment of hazardous geological processes and phenomena reflected in the geometry of the earth's surface already at the initial stages of engineering surveys for the purposes of morphometric analysis, in identifying and assessment of geological processes. The discipline includes computer modeling and practical analysis of the results.	Engineering mathematics applied Physics Basics of computer modeling Digital mapping Theoretical foundations of land management Soil science Geodetic work during cadastre maintenance	Compositional modeling and animation in architecture and urban planning Virtual computer modeling in architecture and urban planning Territorial planning and forecasting Engineering landscaping and transport	SI	
BD	KV	City engineering structures	180	6	5	LO2	Studies special issues of methodology for designing modern types of industrial and civil buildings and the conditions for their placement in the structure of populated areas, general requirements for the space-planning structures of objects, taking into account their functional purpose, technological processes occurring in them, as well as modern requirements for the efficiency and environmental friendliness of the	Engineering mathematics applied Physics Basics of computer modeling The engineering geodesy Construction Materials	Compositional modeling and animation in architecture and urban planning Virtual computer modeling in architecture and	SI	



Module 7- Engineering 1								production environment , services and living environment.	Engineering geology and hydrogeology	urban planning Engineering landscaping and transport	
			Typology of buildings and structures				LO2	Studies the main types of composition, properties and patterns of volumetric-spatial forms, basic theoretical principles for solving compositional problems, characteristic techniques for sketching the search for compositional ideas and subsequent layout, objective laws in the construction of volumetric-spatial forms in architectural design in order to understand the methodology of architectural creativity, which forms the basis of the professional design culture of a specialist in the field of architecture. The discipline uses interactive teaching methods.	Engineering mathematics applied Physics Basics of computer modeling The engineering geodesy Construction Materials Engineering geology and hydrogeology	Engineering landscaping and transport Reconstruction and renovation of urban areas Industrial practice 1 Industrial practice 2	SI
Module 7- Engineering 1	BD	KV	Compositional modeling and animation in architecture and urban planning	180	6	6	LO2	Studies the main types of composition, properties and patterns of volumetric-spatial forms, basic theoretical principles for solving compositional problems, characteristic techniques for sketching the search for compositional ideas and subsequent layout, objective laws in the construction of volumetric-spatial forms in architectural design in order to understand the methodology of architectural creativity, which forms the basis of the professional design culture of a specialist in the field of architecture. The discipline uses interactive teaching methods.	Basics of computer modeling Engineering geodesy Construction Materials Engineering geology and hydrogeology Digital mapping Theoretical foundations of land management	Territorial planning and forecasting Urban planning Reconstruction and renovation of urban areas Engineering landscaping and transport	SI
			Virtual computer modeling in architecture and urban planning				LO2	Forms an understanding of the theoretical and methodological foundations of territorial planning and forecasting, forms and types of strategic plans for the development of cities and regions, territorial planning in the system of strategic management of territorial development, its connection with territorial forecasting and programming, principles and methods for developing strategic plans for the development of cities and regions, taking into account foreign experience in regional planning	Engineering mathematics Basics of computer modeling The engineering geodesy Construction Materials Engineering geology and hydrogeology	Territorial planning and forecasting Engineering landscaping and transport Urban planning Reconstruction and renovation of urban areas	SI



								and management.	Digital mapping		
	BD	KV	Territorial planning and forecasting	180	6	7	LO10	Studies the purpose and use of city streets and roads, their engineering system and equipment, including the following elements: lighting, landscaping, drainage devices, underground communications for various purposes, transport equipment, structures for transport and pedestrians (tunnels, overpasses, pedestrian crossings, viaducts, aqueducts, transport interchanges, etc.), bridges and overpasses in order to organize traffic safety. The discipline uses interactive teaching methods	Basics of computer modeling The engineering geodesy Construction Materials Engineering geology and hydrogeology Digital mapping Theoretical foundations of land management Soil science Geodetic work during cadastre maintenance	Reconstruction and renovation of urban areas Management of land management and cadastral works Management in urban planning Industrial practice 2 Legal support for land management and cadastre Legal support for urban planning	SI
Module 7- Engineering 1			Engineering landscaping and transport				LO9	Studies the purpose and use of city streets and roads, their engineering system and equipment, including the following elements: lighting, landscaping, drainage devices, underground communications for various purposes, transport equipment, structures for transport and pedestrians (tunnels, overpasses, pedestrian crossings, viaducts, aqueducts, transport interchanges, etc.), bridges and overpasses in order to organize traffic safety. The discipline uses interactive teaching methods.	The engineering geodesy Engineering geology and hydrogeology Digital mapping Theoretical foundations of land management Soil science	Reconstruction and renovation of urban areas Industrial practice 2 Legal support for land management and cadastre Legal support for urban planning	SI
Module 8- Engineering 2	PD	KV	Engineering systems design	270	9	7	LO10	Forms skills in the design of engineering systems and hydraulic calculations, theoretical calculations and design of engineering networks, systems and equipment, the principles of operation of water supply equipment, sewerage, heat and gas supply, power supply of settlements and buildings in environmental conditions, selection of optimal engineering systems for the purpose of rational design of a structure, calculation of its structural elements	Basics of computer modeling The engineering geodesy Construction Materials Engineering geology and hydrogeology Digital mapping	Reconstruction and renovation of urban areas Industrial practice 2 Legal support for land management and cadastre Legal support	SI



								and selection of necessary equipment. The discipline includes on-site classes at a branch of the department and guest lectures by top managers.	Theoretical foundations of land management	for urban planning	
			Planning of utilities and equipment				LO10	Studies the theoretical and practical foundations of managing organizations engaged in land management and cadastral activities in conditions of market relations that contribute to increasing the efficiency of their activities, the basic concepts and methods associated with the management of land management and cadastral works, legal and financial aspects and mechanisms for the practical application of basic approaches to management in in the field of land management and cadastral works.	Basics of computer modeling The engineering geodesy Construction Materials Engineering geology and hydrogeology Digital mapping Geodetic work during cadastre maintenance	Reconstruction and renovation of urban areas Industrial practice 2 Legal support for land management and cadastre Legal support for urban planning	SI
Module 8- Engineering 2	PD	KV	Management of land management and cadastral works	180	6	7	LO4	Forms a system of ideas about the principles of organizing design institutes working in the field of urban planning and skills in implementing urban planning policies in modern conditions, the ability to effectively use and develop business competencies in the field of management in modern architectural and urban planning practice, organizing activities for the implementation of urban planning policies and design solutions process in the field of architectural, construction and urban planning.	The engineering geodesy Construction Materials Engineering geology and hydrogeology Digital mapping Theoretical foundations of land management Soil science	Reconstruction and renovation of urban areas Legal support for land management and cadastre Legal support for urban planning Industrial practice 2	SI
			Management in urban planning				LO4	Forms knowledge of the principles and norms of land law, as a general legal basis for land management and cadastral work, legislative documents and their place in matters of regulation of land relations, ways and methods of overcoming various and numerous problems using the legal regulatory mechanism for making legal decisions in matters of land and property relations land users and land owners.	The engineering geodesy Construction Materials Engineering geology and hydrogeology Digital mapping Geodetic work during cadastre maintenance	Legal support for land management and cadastre Legal support for urban development Reconstruction and renovation of urban areas Industrial practice	SI



										2	
Module 8 Engineering 2	PD	KV	Legal support for land management and cadastre	180	6	8	LO4	Studies the main regulatory documents of urban planning, the procedure for organizing regulatory support for urban planning activities, subjects, organization and management of urban planning activities, methods of analysis and processing of questionnaires (questionnaires) and statistical data in order to optimize decisions on urban planning and territorial development, methods writing urban planning regulations to implement the text part of the urban planning plan of the land plot.	The engineering geodesy Engineering geology and hydrogeology Digital mapping Theoretical foundations of land management Soil science Geodetic work during cadastre maintenance	Industrial practice 2 FINAL EXAMINATION	SI
			Legal support for urban planning				LO4	Reveals the content of the system of legal regulation of urban development activities in a market economy, helps to instill skills in applying this system in practical activities to manage urban development, including the system and principles of technical regulation and standardization, master methods of analyzing regulatory legal acts, technical regulations and standards in design and construction .	The engineering geodesy Engineering geology and hydrogeology Digital mapping Theoretical foundations of land management		Industrial practice 2 FINAL EXAMINATION
Module 9- Resource management	PD	KV	Managerial economics	90	3	5	RO6	Formation of the conceptual framework and development of economic analysis skills using modern models and patterns of economic activity science, consideration of economic problems and tasks facing the head of the company. Studying this discipline will allow students to gain and develop knowledge in the field of analytical research of economic, technological and technical parameters of the enterprise, as well as to master the skills of applying special methods of economic justification of management decisions and assessing their consequences.	Engineering mathematics, Fundamentals of economics and entrepreneurship	Organization of construction of transport infrastructure facilities, Organization and planning of construction of transport structures,Modernization of railway lines, Reconstruction of railways	LMT



Module 5 IT competencies	PD	KV	Time management	90	3	5	PO6	Formation of students ' general ideas about the essence and types of time management, principles and methods of management a temporary resource for more successful implementation of professional activities.	Sociology, CulturalStudies, Psychology,Phylosophy , Engineering mathematics.	Organization of construction of transport infrastructure facilities, Organization and planning of construction of transport structures, Modernization of railway lines, Reconstruction of railways	LMT
Module 9- Resource management	PD	KV	Transport logistics	90	3	6	PO6	Study of the main provisions of transport support of logistics systems, activities in the field of transportation, covering the entire range of operations and services for the delivery of goods from the manufacturer to the consumer, principles of design and construction of logistics systems. Mastering the skills of optimizing and organizing rational cargo flows, their processing in specialized logistics centers, ensuring an increase in their efficiency, reducing unproductive costs and expenses. The training methods are: problem solving, conducting thematic colloquiums, brainstorming seminars. The discipline includes guest lectures by leading experts of transport and logistics companies	Fundamentals of economics and entrepreneurship,чнов ы new computer modeling	Organization of construction of transport infrastructure facilities, Organization and planning of construction of transport Modernization of railway lines, Reconstruction of railways	LMT
Module 5-IT competencies	PD	KV	Digital diagnostics of transport structures	90	3	6	RO6	Study of digital technologies of transport structures information processing systems, basic functional units, principles of information division and multiplexing, analysis of characteristics of digital communication channels in diagnostics of transport construction objects	Information and communication technologies, Engineering mathematics, Applied physics, Fundamentals of computer modeling	Organization of construction of transport infrastructure objects, Organization and planning of transport construction Modernization of railway lines, Reconstruction of railways	SI
Module 9-	PD	KV	Resource saving	90	3	7	PO6	Study of the main types and characteristics of	Ecology and life	Modernization of	



Resource management			in transport					energy resources, regulatory support for energy saving, improving the energy efficiency of the transportation process; energy-saving technologies in repair production and operation of transport infrastructure facilities; organization and methods of energy saving management. It is used to solve problems, conduct thematic colloquiums, debates. Guest lectures are held by leading experts of the transport and communication industry	safety, Methods of scientific research, Fundamentals of law and anti-corruption policy. culture, Fundamentals of economics and entrepreneurship	railway lines, Reconstruction of railways	PS
Module 5-IT competencies			Business analytics Power BI	90	3	7	PO6	Teaches the skills of creating interactive visualizations of data obtained from various sources and providing them to employees of this organization, obtaining valuable information when making strategic decisions, analyzing retrospective and current results. data analysis, presentation of results in intuitive visual formats providing general access to business-critical analytical data using Power BI	Information and communication technologies, Fundamentals of Economics and Entrepreneurship, Engineering Mathematics, Fundamentals of Computer Modeling	Railway line modernization, Railway Reconstruction	ICT
	<b>Total</b>			<b>2580</b>	<b>86</b>						

Head of the Department of "Construction Engineering"

Ismagulova S. O.