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APPROVED
 Director of the A&T Institute
 A. Toygozhinova
 «30» 03 2023 y.

CATALOG OF DISCIPLINES OF THE OPTIONAL COMPONENT

EDUCATIONAL PROGRAM

7M06128 -Information systems (by industry)

Degree to be conferred: master's degree

Period of study: 2 years

Year of admission: 2023 y.

Module	Cycle	Component	Name of the discipline	General labor intensity		Semester	Learning Outcomes	Brief description of the discipline	Prerequisites	Postrequisites
				in academic hours	in academic credits					
1	2	3	4	5	6	7	8	9	10	11
Module 4 – Professional competencies	DB	HF	Neural network processing technologies information	270	9	1	LO8	The discipline studies the neural network approach to modeling various processes, the principles of their functioning, teaching methods, use in encryption and key distribution, as well as in other areas of information security.	Undergraduate disciplines	Scientific foundations of modeling in infocommunication technologies, Final certification
		HF	Theory of forecasting and decision making				LO7	The discipline studies the fundamentals of forecasting theory, models of correlation and regression analysis for solving problems of the transport and communication complex (TCC), the process of making management decisions, its participants and stages, classification of decision-making problems, decision-making theory, operations research, systems analysis and their interrelationships, mathematical model of a management decision-making situation, non-dominated strategies, computer decision support systems for TCC.	Bachelor's cycle database	final examination
Module 2 - Economic and managerial competencies	DB	HF	Strategic management	180	6	2	LO1	Formation of basic theoretical knowledge and basic practical skills in the field of strategic management of enterprises and organizations, strategic analysis of the external and internal environment of the company, competitive strategy of the company and corporate management strategy. Active learning methods are used - brainstorming, group work	Bachelor's cycle database	final examination

		HF	Business research				LO1	Mastering the theory by master's students, as well as developing practical skills in business research and analytics, life cycle analysis of the development of promising technologies. The scientific and technical aspects of the project are being studied. Active learning methods used in the discipline - individual assignment	Bachelor's cycle database	final examination
Module 4 – Professional competencies	PD	HF	Development risk management software	180	6	3	LO6	Considers the basic concepts of the theoretical and methodological basis for mastering knowledge in the field of risk management, forming an understanding of the practical aspects of the functioning of risk management units at enterprises.	Bachelor's cycle database	final examination
		HF	Object-oriented design and programming methodology				LO6	The discipline develops skills in mastering the methodology of the object approach, object-oriented and generalized programming using modern tools, working with typical problems and design techniques.	Bachelor's cycle database	final examination
Module 4 – Professional competencies	PD	HF	Data management in information systems	180	6	2	LO3, LO4	The discipline is aimed at studying practical skills in the field of data management in information systems, allowing the use of modern methods for identifying data in the subject area, organizing data into certain “correct” structures and performing data manipulation in order to meet the information needs of users.	Bachelor's cycle database	final examination
		HF	Data Mining				LO3, LO4	The discipline is aimed at studying the basic methods of applied data analysis, developing skills in the practical application of intelligent analysis methods to solve various scientific and practical problems of economics and management	Bachelor's cycle database	final examination
Module 4 – Professional competencies	PD	HF	Corporate IP models	180	6	2	LO7	The discipline is aimed at studying the systematization of the conceptual apparatus, basic theoretical principles and methods, and the application of theoretical knowledge to study professional tasks in the field of development of corporate information systems.	Undergraduate disciplines	IoT with Big Data processing/Convergence of telecommunications services, Final certification
		HF	Integrated automation and control technologies				LO7	The discipline studies integrated automation and control technologies, provision and organization of automation levels, functions and structures of integrated systems in organizations, tools for building integrated design and control systems, automation of technological processes of vehicles and transport infrastructure, methods for developing a functional diagram of a SCADA system, modern SCADA-systems for railway transport..		Master's student's research work, Final certification
Module 4 – Professional	PD	HF	Administration of multi-user databases	180	6	2	LO5	The discipline develops skills in the design and maintenance of information and communication systems and networks, development and implementation of transport databases,	Bachelor's cycle database	final examination

competencies								administration and protection of databases, studies the architecture of a distributed database, project management tools, the most common project management systems: Microsoft Project, Project Manager			
		HF	Modern models and methods of cryptographic protection of information systems					LO5	Studies the basic mathematical research of formalized structures, the formation of logical and systematic thinking of undergraduates. Principles of information protection using cryptographic methods and examples of the implementation of these methods in practice. Modern cryptosystems in particular, their cryptanalysis and the underlying mathematical tools are studied.	Undergraduate disciplines	final examination
Module 4 – Professional competencies	PD	HF	Modern optimization methods	270	9	3		LO7	The discipline is aimed at developing master's students with basic models of optimization type, the main methods of their research and search for solutions. Among the classes under consideration are linear programming problems, including transport-type problems, solved using finite methods. To study nonlinear optimization problems, the apparatus of convex analysis and optimality conditions are used. The main approaches to constructing methods for minimizing convex functions, including those with nonlinear constraints, are also outlined. In parallel with the presentation, word problems are solved.	Bachelor's cycle database	final examination
		HF	Cloud computing					LO8	Studies modern methodologies and technologies for creating cloud software; mathematical foundations of real-time systems, principles of organizing modern cloud services and systems that can be applied in the development and research of new software. Studying the discipline should contribute to the acquisition of skills in designing architecture and using elements of cloud technologies in application software systems.	Bachelor's cycle database	final examination
Total				1440	48						

Head of the Department "ICT"



D.T. Kasymova