APPROVED
at a meeting of the
Scientific Council
NJSC «Al-Farabi KazNU».
Minutes No.10 dated
May 13, 2023.

The program of the entrance exam for applicants to the PhD for the group of educational programs D148-«Logistics»

1. General provisions.

1. The program was drawn up in accordance with the Order of the Minister of Education and Science of the Republic of Kazakhstan dated October 31, 2018 No. 600 "On Approval of the Model Rules for Admission to Education in Educational Organizations Implementing Educational Programs of Higher and Postgraduate Education" (hereinafter referred to as the Model Rules).

2. The entrance exam for doctoral studies consists of writing an essay, passing a test for readiness for doctoral studies (hereinafter referred to as TRDS), an exam in the profile of a group of educational programs and an interview.

Block	Points
1. Essay	10
2. Test for readiness for doctoral studies	30
3. Exam according to the profile of the group of the educational program	40
4. Interview	20
Total admission score	100/75

3. The duration of the entrance exam is 4 hours, during which the applicant writes an essay, passes a test for readiness for doctoral studies, and answers an electronic examination. The interview is conducted on the basis of the university before the entrance exam.

2. Procedure for the entrance examination.

1. Applicants for doctoral studies in the group of educational programs D148- «Logistics» write a problematic / thematic essay. The volume of the essay is at least 250-300 words.

2. The electronic examination card consists of 3 questions.

Topics for exam preparation according to the profile of the group of the educational program.

Discipline **"Transport logistics»**

Topic 1. The socio-economic nature of transport and its role in the logistics business.
Sub-topics: The economic nature of transport, transport products and the quality of customer service. Transport system of the Republic of Kazakhstan and technical and economic features of various types of transport.

Topic 2. Material and technical base of cargo and commercial work of various types of transport.
Sub-topics: Characteristics of the material and technical base of various types of transport. Indicators that characterize the use of wagons, ships, and cars in the transportation of products. Nomogram for the calculation of technical and operational indicators of road transport during the transportation of products.

Topic 3. Transport characteristics of goods and cargo transportation.
Subtopics: Classification and characterization of goods. Determination of the mass of the cargo for its transportation. Types, classification and characteristics of cargo transportation. Containers, containers, pallets used by transport for the transportation of products. Transport and technological systems. Container transport system.

Topic 4. Tariffs and payments for the transportation of goods by various modes of transport
Sub-topics: Pricing in the transport services market. Theoretical aspects of determining the tariff. Freight rates for various types of transport.

Topic 5. Rationalization of cargo transportation.
Sub-themes: The importance of transport rationalization. Types of irrational transportation. Causes and ways to eliminate irrational transportation. Rationalization of transportation of certain types of products. Rational range of motor transport when transporting products from a regional warehouse. Attaching consumers to suppliers using linear programming methods.

Topic 6. The influence of the logistics factor on the efficiency of product sales in foreign markets.
Sub-topics: Transport component in the price of delivery of goods to foreign markets. Basic and transport terms of international trade contracts. Logistics providers and logistics service outsourcing

Topic 7. Transport logistics in the context of the globalization of the world economy.
Sub-topics: Current state and structure of the global logistics services market. The main trends in the development of the logistics infrastructure of the international trade system. Scientific and technological progress and innovative processes in the field of international logistics.

Topic 8. Transport logistics management in the Republic of Kazakhstan
Sub-topics: Transport logistics management at the federal level. Transport logistics management at the corporate level. Information flows in corporate logistics.

Topic 9. Management of transport logistics in water transport.
Sub-topics: Water transport management in the Republic of Kazakhstan. Contractual relations in the case of water transportation. The main international agreements and conventions regulating the issues of transport logistics in water transport. Forms of organization of ship traffic. The main documents that perform the functions of the contract for water transport. Tariffs applicable to water transport in Russia. The procedure for planning water transport. Organization of delivery of goods by sea during export. Organization of delivery of goods by sea during import.

Topic 10. Management of transport logistics in rail transport
transport. The legislative framework for the activities of Kazakhstan railways and the organizational structures for the implementation of railway transportation. International organizations operating in the field of railway transport. Organization of cargo transportation by rail.

Agreement on International Rail Freight Transport. Procedure for the transportation of goods by rail to the countries of Western Europe Contract of carriage by rail. Tariffs applicable to the railway transport of the Republic of Kazakhstan.

Topic 11. Organization of cargo and commercial work on road transport.

Subtopics: Organization of road transport when delivering products to consumers.

Routing of road transport. Calculation of some indicators for the efficient operation of the car on routes. Calculation of technical and operational performance indicators of the car on a group of routes. Application of mathematical methods in the organization of cargo transportation Organization of international cargo transportation by road. Tariffs for road transport.

Topic 12. Management of transport logistics in air transportation

Sub-topics: The role and place of air transport in economic relations. Organization of cargo transportation by air. Fares for air transportation.

Discipline **« Warehouse logistics»**

Topic 1. The essence of warehouse logistics, its tasks, concept and principles

Subtopics: The role and functional purpose of warehouses in logistics. Warehouse functions. General and specific tasks of warehouse logistics, its coordination and interaction with other logistics technologies. The role of warehouse logistics in improving the competitiveness of commercial business structures

Topic 2. Warehouse network and warehouse management

Subtopics: Main purpose and types of warehouses. Classification of warehouses in logistics. The main problems of warehouse management and warehouse logistics. Choosing the form of ownership of the warehouse. Determining the number of warehouses.

Topic 3. Planning a warehouse as a link in the supply chain

Subtopics: Determining the type and size of the warehouse. Development of a storage system. Development of the logistics process in the warehouse. An algorithm for solving warehousing problems in logistics. Planning of storage capacity requirements. Analysis of potential storage capacity.

Topic 4. Technology of warehouse logistics operations

Subtopics: Unloading and initial acceptance of goods. Acceptance of goods from carriers. Acceptance of goods by quantity. Acceptance of goods by quality. Participation in the acceptance of representatives of suppliers. Product placement (placement methods, address system, product placement). Storage of goods. Shipping of goods Marking. Shipment

Topic 5. Organization and management of the logistics process in the warehouse

Subtopics: Basic logistics principles of warehouse technologies: improving the efficiency of warehouse capacity utilization; improving operational efficiency, improving staff working conditions and reducing heavy manual labor, improving logistics service, reducing logistics costs.

Topic 6. Technical aspects of warehouse organization

Subtopics: Facilities for ensuring the safety of goods; facilities for unloading and loading; lifting and transport equipment; containers for placing goods during storage; devices and equipment for moving, packaging, stacking, stacking and storing goods and preparing them for shipment; weighing and measuring equipment; fire-fighting equipment; security alarm systems; packaging equipment; marking equipment. The technology of cargo handling in the warehouse. Structure of the warehouse service personnel. Warehouse costs as part of total logistics costs

Topic 7. Packaging and packaging in the warehouse sector

Subtopics: Classification of unified packaging for storage systems. The concept of a cargo unit and a base module. Marking.

Topic 8. Warehouse management

Subtopics: Principles of logistics organization of warehouse processes. Network planning of warehouse processes. Standardization of warehouse processes. Technological maps and graphs. Control of warehouse activities. Intensification of external commodity flows. Optimization of intra-

warehouse processes. Inventory management. Acceleration of inventory turnover. Inventory management. Inventory rationing. Inventory optimization.

Topic 9. Warehouse performance indicators

Subtopics: Indicators of the warehouse logistics subsystem, their impact on the indicators of other logistics subsystems and the logistics system as a whole. Storage costs. Indicators of the efficiency of the warehouse operation. Indicators of the efficiency of the use of fixed assets, warehouse technological equipment and labor. The impact of these indicators on other elements of the logistics system. Warehouse performance. Determination of capital expenditures for the reconstruction and construction of new warehouses. Calculation of operating costs for the warehouse.

Topic 10. Warehouse management Information systems

Subtopics: Information and computer technologies (ICT) warehouse managers as one of the main sources of improving warehouse productivity, the effectiveness of decisions on cargo handling and the competitiveness of the company. Information technology as a prerequisite for the operation of modern warehouses. Information technologies based on automatic identification of goods, containers, cargo units, etc. The use of automatic identification in the performance of warehouse operations, the benefits of their use. Barcodes and radio frequency identification-RFID as the basis for managing cargo flows in the warehouse. Real-time monitoring of operations. WMS warehouse management systems. Functionality of modern WMS systems. Classification of warehouse management systems-WMS.

Discipline **« Inventory management in the logistics system»**

Topic 1. The concept and functions of stocks. Inventory classification.

Sub-topics: The subject, goals and objectives of the discipline. The concept and functions of stocks. Inventory classification. Basic definitions related to inventory.

Topic 2. Development of the theory and practice of inventory management in supply chains. Inventory as an object of management in supply chains.

Sub-topics: Development of inventory management methods. Inventory as an object of management in supply chains. Inventory concepts in logistics and supply chain management. Inventory and material flow.

Topic 3. Determining the need for inventory. Inventory maintenance costs.

Subtopics: Rationing the level of stocks and working capital invested in stocks

Classification and analysis of methods for determining inventory requirements. Classification costs associated with inventory management, methods for determining them. Rationing of inventory levels and working capital invested in inventory. Methods for estimating inventory of inventory items (FIFO, LIFO, weighted average).

Topic 4. Statistical methods for determining the indicators of current and insurance stocks.

Subtopics: Static inventory management task Classification and analysis of statistical calculation of current and insurance inventory indicators. Methods for solving static inventory management problems ("the newspaperman's problem", "the baker's problem", "the Christmas tree problem").

Topic 5. The model for calculating the optimal volume and frequency of the Harris-Wilson order and its modifications

Subtopics:The classic Harris-Wilson model for calculating the optimal (economical) batch of an EOQ order and its variants. Corrected versions of the Harris-Wilson model. A model for calculating the optimal (economical) batch of an order in the condition of multi-product and multi-product deliveries.

Topic 6. Methods of calculating the indicators of the insurance stock. The relationship between current and insurance stocks.

Subtopics:Analysis of the main approaches for calculating the indicators of the insurance stock. Probabilistic and statistical model for determining the indicators of the insurance stock (Fetter-Brown and Bowersox-Kloss formulas).

Topic 7. Inventory management strategies (models) in supply chains and their application conditions

Subtopics: The main strategies (models) of inventory management: a model with a fixed order frequency and a model with a fixed level of control. Combined inventory management models. Simulation modeling in inventory management.

Topic 8. Inventory management under conditions of risk and uncertainty

Subtopics: Risks of inventory maintenance and scarcity. Methods for calculating the optimal delivery batch, taking into account the shortage. A model for determining inventory parameters based on the concept of total cost analysis in supply chains.

Topic 9. Inventory management, taking into account the classification of material and technical resources by importance

Subtopics: The concept of nomenclature groups. The ABC method. The XYZ method.

Topic 10. Algorithm for designing optimal inventory management systems in supply chains.

Subtopics: The concept of an optimal inventory management system. Stages of inventory management in supply chains. Accounting and control of information about the formation of stocks. Mathematical models for optimizing inventory management in supply chains. The role of the third and fourth parties of logistics (3 PL and 4 PL) in the formation of supply chains and inventory management in them. Models for optimizing inventory management in multi-level (layered) logistics systems.

Discipline **«Supply Chain Management»**

Topic 1. Evolution of the concept of supply chain management (CCP). Definitions of ADC.

Subtopics: The stages of the formation of the concept of UCP, different approaches to the definition of the concept itself, views on the relationship of the terms "logistics" and UCP.

Topic 2. Object and process view of the supply chain.

Subtopics: Concepts of the business process, main and auxiliary, the description of object and process approaches to the decomposition of supply chains is given.

Topic 3. Objectives and strategic elements of the ADC.

Subtopics: Tasks of supply chain management, data on the effectiveness of the considered approach are given, the stages of supply chain management are studied.

Topic 4. Network structure and classification of supply chains.

Subtopics: Classification of supply chains: direct supply chain, extended supply chain, maximum supply chain, the concept is given and the reasons for the appearance of the network structure of the CPU are given.

Topic 5.Sets of flows and processes in supply chains.

Subtopics: Logistics functions related to operational activities and functions related to the coordinating and integrating activities of the supply chain. Key business processes. Customer relationship management. Customer service management. Execution of customer orders. Supplier relationship management. Managing return flows.

Topic 6. Integration of key business processes: macro processes in the supply chain.

Subtopics: The concept of the business process, the main and auxiliary processes, the description of the business processes of J. R. R. Tolkien. Stock and D. Lambert.

Topic 7. Strategic elements of the ADC.

Subtopics:Value chains; strategic positioning; cost factors; strategic structural and functional factors.

Topic 8. Logic of strategic planning and design of supply chains.

Sub-topics: Stages of supply chain design:problem identification and project planning, data collection and analysis, implementation recommendations, and project implementation.

Topic 9.The main drivers and obstacles in the supply chain.

Sub-topics: The main factors that can help to properly manage supply chains and the factors that can be a hindrance to this.

Topic 10. The problem of optimizing supply chain management.

Subtopics: The main approaches to optimizing supply chain management processes aimed at achieving competitive advantages and stability of the organization in the market.

Topic 11. Principles of construction and structure of the SCOR model of the supply chain.
Subtopics: Definition of the reference model and outlines the essence of the SCOR model. A "four-level pyramid" that defines the depth of process detail and allows you to combine the concepts of business process reengineering, benchmarking, and using best practices in the SCOR model.

Topic 12. Cost-effectiveness of ADC solutions.
Subtopics: The concepts of MTSP indicators for evaluating the effectiveness of logistics solutions and describes the scheme for developing a system of balanced indicators. Concepts of KPI indicators and explains how to apply these indicators for the purposes of monitoring and evaluating management.

3. List of references.

Main:

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Additional:

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