

**МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ**  
**ХАРКІВСЬКИЙ НАЦІОНАЛЬНИЙ ЕКОНОМІЧНИЙ УНІВЕРСИТЕТ**  
**ІМЕНІ СЕМЕНА КУЗНЕЦЯ**

**ЗАТВЕРДЖЕНО**

на засіданні кафедри  
менеджменту, логістики та інновацій  
Протокол №2 від 31.08.2023 р.

**ПОГОДЖЕНО**

Проректор з навчально-методичної роботи

Каріна НЕМАШКАЛО



**ФУНКЦІОНАЛЬНА ЛОГІСТИКА**

робоча програма навчальної дисципліни (РПНД)

Галузь знань  
Спеціальність  
Освітній рівень  
Освітня програма

**07 "Управління та адміністрування"**  
**073 "Менеджмент"**  
**перший (бакалаврський)**  
**"Логістика"**

Статус дисципліни  
Мова викладання, навчання та оцінювання

**обов'язкова**  
**англійська**

Розробник:  
к.е.н., доцент

Тетяна КОЛОДІЗЄВА

Завідувач кафедри  
менеджменту, логістики та  
інновацій

Олена ЯСТРЕМСЬКА

Гарант програми

Тетяна КОЛОДІЗЄВА

Харків  
2023

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE  
SIMON KUZNETS KHARKIV NATIONAL UNIVERSITY OF ECONOMICS

**APPROVED**

at the meeting of the department  
management, logistics and innovation  
Protocol № 2 of 31.08. 2023.

**AGREED**

Vice-rector for educational and methodical work

 Karina NEMASHKALO



**FUNCTIONAL LOGISTICS**

**Program of the course**

Field of knowledge  
Specialty  
Study cycle  
Study programme

**07 "Management and administration"**  
**073 "Management"**  
**first (bachelor)**  
**"Logistics"**

Course status  
Language

**mandatory**  
**English**

Developer:  
PhD (Economics),  
Associate Professor



Tetiana KOLODIZIEVA

Head of  
Management, Logistics and Innovation  
Department



Olena IASTREMSKA

Head of Study Programme

Tetiana KOLODIZIEVA

**Kharkiv**  
**2023**

## INTRODUCTION

The course "Functional logistics" is aimed at education seeker assimilation of fundamental knowledge on optimization and management of the main logistics functions and phases of material flow promotion - transportation, warehousing, cargo processing, stock formation, information support, supply, production and sales.

The purpose of the course "Functional logistics" is to study the basic functions of logistics in detail, mastering theoretical knowledge and practical skills of organizational, technological, technical and information support of the basic functions of logistics.

The objectives of the academic discipline are:

carry out operational and current management of individual links of logistics chains and the performance of individual logistics functions, using knowledge of functional areas of logistics;

to systematically connect the procurement of material resources with the production and sale of finished products, the formation of stockpiles of goods and material values, storage, transportation, cargo processing and information support, using the principles of logistics.

The object of the educational discipline is the process of managing information provision, stocks, warehousing, transport, cargo processing, supply, production, sales at enterprises.

The subject of the educational discipline is the general principles and regularities of management of information provision, stocks, storage, transport, cargo processing, supply, production, sales.

The learning outcomes and competence formed by the course are defined in the table. 1.

Table 1

Learning outcomes and competences formed by the course

<b>Learning outcomes</b>	<b>Competences that must be mastered by a student of higher education</b>
LO4	SC12
LO5	SC11
LO 18	GC5, SC2, SC 16
LO 19	GC5, GC 8, SC 2, SC 16, SC 17
LO 22	GC 5, SC 20

where, GC 5. Knowledge and understanding of the subject area and understanding of professional activity.

GC 8. Skills in using information and communication technologies.

SC 2 . The ability to analyze the results of the organization's activities, to compare them with the factors of influence of the external and internal environment.

SC 11. Ability to create and organize effective communications in the management process.

SC 12. The ability to analyze and structure the problems of the organization, to form reasonable solutions.

SC 16. The ability to form a comprehensive program to increase the company's competitiveness on the national and international markets from the point of view of logistics as a new paradigm of entrepreneurial activity.

SC 17. The ability to carry out organizational, technological, technical and information support of the basic functions of logistics. The ability to manage the logistics activities of enterprises in the areas of production, stocks, warehousing, procurement, sales, transportation and cargo processing.

SC 20. The ability to effectively analyze and integrate the logistics concept into international activity, to analyze the conceptual bases and determine the main categories of international logistics, to apply the optimization factor in the delivery of goods in international communication. The ability to choose the optimal mode of transport in international communication, to make effective decisions in the process of implementing international logistics activity.

LO4 Demonstrate skills in identifying problems and justifying management decisions.

LO5 Describe the content of the functional areas of the organization.

LO 18. Use the principles and methods of logistics in the general management system of the enterprise to reduce costs and optimize logistics flows and processes of organizations.

LO 19. To apply a logistic approach to resource management of organizations and to ensure an increase in their competitiveness. Demonstrate skills in optimizing the organizational and technological aspects of the main functions of logistics using communication and information support.

LO 22. The ability to apply the optimization factor in the delivery of goods in international traffic, to choose the optimal mode of transport in international traffic. Analyze international agreements, analyze risks in international logistics.

## **COURSE CONTENT**

### **Content module 1 . Cargo processing logistics**

#### **Topic 1. Logistics of cargo processing. Cargo processing in logistics networks**

Basic principles of freight processing. Mechanized cargo handling systems in the warehouse and during transportation. Semi-automated and automated cargo handling systems. Efficiency of freight processing. Cargo unit as an element of logistics. The formation of a cargo unit, its role and characteristics.

#### **Topic 2. Cargo containerization**

Containerization and consolidation of cargo. Consumer and industrial packaging. Protection against damage. Packaging materials. The role of containers and packaging in logistics chains. Product marking. Methodology for calculating indicators in the transport party.

#### **Topic 3. Methods of identification and data storage in logistics management**

Principles of organization of information flows in the logistics system. Informational production support. Informational support for distribution. Logistic information and computer technologies. Information systems for decision support. Information security systems. Analysis of threats and information risks. Information

security at the stages of collection, transmission and storage.

**Topic 4. Information support of basic logistics elements: stocks and storage, transportation and forwarding, production, distribution**

Trading enterprise management systems . Automated warehouse management systems. Control over the supply of goods in the warehouse. Automated transportation management systems. Simulation modeling systems.

**Topic 5. Integrated information technologies in cargo processing logistics**

Electronic trade. Virtual business. Intellectual and analytical systems. Analysis of threats and information risks. Using the technology of automated barcode identification in logistics. Protection of information at the stages of collection, transmission and storage. Peculiarities of construction of logistic information systems . Information technologies in logistics.

**Content module 2. Transport logistics**

**Topic 6. The essence of transport logistics**

Functions and principles of transportation. Prerequisites and selection of vehicles. Means of transport. Ranking of species in transport. Classification of intra-production transport systems with distinctive features.

**Topic 7. Transportation technology**

Providers of transport services. Goods delivery systems: unimodal, multimodal, intermodal, terminal. Planning and organization of transportation. Choose the optimal method of transportation. Cargo distribution center. New logistics systems of cargo collection and distribution. Choose the optimal carrier. The level of transportation tariffs. Determining the need for warehouse transport and lifting equipment.

**Topic 8. Analysis of the efficiency of the transport process**

Economic feasibility of delivering goods by various modes of transport. Calculation of the optimal ratio of rented and own transport. Calculation of transport costs. Evaluation of the efficiency of investment in the project of the system of warehouse lifting and transport equipment.

**Topic 9. Transportation routing**

Information support of transportation. Automated transportation tracking systems. Planning of collection and delivery routes. Analysis of requirements proposed by customers to the cargo delivery system in .

**Topic 10. Cargo insurance and carriers' liability**

The concept of cargo insurance and its specifics. Groups of risks during cargo insurance and the procedure for managing them. Transfer of risks of loss and damage of cargo from the seller to the buyer under various conditions of cargo delivery, in accordance with Incoterms 2020. Legal security of transportation. The process of designing a cargo delivery system.

**Topic 11. The role and importance of transport and forwarding support**

Functions of the freight forwarding. Rules of cargo transportation. Forwarding service. Logistics model of forwarding. Goods and transport

documentation. Normative documents regulating the procedure for receiving goods. Scheme of document circulation of the composition of wholesale trade enterprises .

### **Content module 3 . Production logistics**

#### **Topic 12. Production logistics and the effectiveness of the application of the logistics approach to the management of material flows in production**

Goals and ways of implementing a logistic approach in the management of material flows in production. Logistical approach to the management of material flows in production. Requirements for the organization and management of material flows in production. Production logistics and the laws of organizing highly efficient, rhythmic production processes. The law on the orderliness of promotion of labor items in production. The law of calendar synchronization of the duration of technological operations. The law of emergency of the main and auxiliary production processes. The law on reservation of resources in production. The law of the rhythm of the production cycle of order fulfillment.

#### **Topic 13. Material flow management systems in production: what pushes and what pulls**

Two types of operating systems: pull and push. Features and schemes of operation of pulling and pushing systems. Operating systems and their varieties .

Systems "Kanban", MRP-1, MRP-2, MRP-3 ("Kanban"-MRP-2), OPT, LRP, KALS, LP, PRM, SRP.

#### **Topic 14. Organization of production and logistics**

Logistical aspects of production planning (technical and economic planning). Planning the need for materials, logistics capacities, waste disposal. Organization of production processes. In the management and regulation of the production process (operational-calendar planning). Justification of the optimal level of specialization, optimal production technology, optimal size of the internal order (batch), optimal use of technological time.

#### **Topic 15. Choice of production location**

The place of micrologistics systems of industrial enterprises in macrologistics systems.

The place and role of micrologistics systems of industrial enterprises in macrologistics systems. Rating assessment of locations of industrial facilities.

The main and additional factors affecting the placement of industrial enterprises. Rating assessment of locations of industrial facilities.

#### **Topic 16. The main indicators of production logistics**

Calculation of production indicators. Time spent on moving the flow of raw materials, materials and work-in-progress. Costs of logistics operations and their share in the cost of industrial products. The level of stocks of material resources, work in progress, containers and finished products. The speed of rotation of stocks of material resources in warehouses and in general in the enterprise. The degree of risk associated with storage and intra-plant transportation of material resources. The volume of losses of raw materials, materials , containers, work-in-progress and

finished products.

## **Content module 4 . Logistics stock in**

### **Topic 17. Inventory in logistics**

Inventory functions and inventory management principles. Inventory planning. Determination and calculation of inventory requirements. Justification of norms of production and commodity stocks. Mode of supply and volume of insurance stock. Required amount of production stock. The policy of inventory management in production and in the field of circulation. Features of management of production and commodity stocks.

### **Topic 18. Systems of optimal inventory management**

Inventory management systems. Stock management system with fixed order size. Calculation of the optimal size of the supply batch and frequency of orders. Inventory management system with a fixed time interval between orders. Strategies for optimal inventory management. Inventory management optimization criterion. Optimal inventory management in case of deterministic and random demand. Inventory modeling. Risks of holding stocks. Stock inventory. Automated inventory management systems.

## **Content module 5 . Warehouse logistics**

### **Topic 19. Warehouse logistics**

Purpose, tasks and functions of warehouse logistics. The role and place of the warehouse in the logistics system. Functions and types of warehouses. Warehouse planning. The main areas of warehouses and their characteristics. Calculation of the areas of the main warehouse areas. The main problems solved by warehouse logistics. Choice between own warehouse or public warehouse. Determination of the number of warehouses and the location of the warehouse network. Determination of the type, size and location of the warehouse. Selection of warehouse system and warehouse equipment. Development of a warehouse system. Technical and economic characteristics of the economic activity of the warehouse.

### **Topic 20. Logistics process in the warehouse**

Technological schemes of warehouse processes. Schematic diagram of technological processing of goods. Designation and use of technological maps and daily work schedules in warehouses. Network planning of warehouse processes. Network planning and construction of network graphs.

### **Topic 21. Organization of warehouse processes with elements of logistics**

A brief description of warehouse operations. Arrival of goods in the warehouse. Incoming control of the supply of goods in in stock The task of determining the number of loading and unloading positions per warehouse. Advantages and disadvantages of combining loading and unloading positions. Determination of dimensional parameters of loading and unloading ramps. Placement of goods in the warehouse. Using the Pareto method (20/80) to make a decision on placing goods in the warehouse. Selection of the assortment according to

the order of wholesale buyers. Shipment of goods from the warehouse.

### **Topic 22. Unit unit as an element of logistics**

Unit load as an element of logistics. The formation of a unit load, its role and characteristics. The size of the unit load. Technical support of warehouses. The role of containers and packaging in the organization of the logistics process in the warehouse. Automation of warehouse complex management.

### **Topic 23. Organization of document circulation in the warehouse**

Warehouse document flow. Normative documents regulating the procedure for receiving goods. Scheme of document circulation of the composition of wholesale trade enterprises. Transfer of responsibility during acceptance of goods. Documents used for registration of acceptance of goods. Documents involved in the operations of placing goods for safekeeping. The question of transfer of responsibility.

## **Content module 6 . Purchasing logistics**

### **Topic 24. Material and technical support, system and form of supplies**

The main stages of the material flow are supply, production, and sales. The fundamental difference between the logistic approach and the previous management of the movement of material resources. The form of the material flow existence. Material and technical support. A logistic approach to the organization of the material resources supply. Types of material resources. Variants of organization of supply. The difference between a logistic and a traditional approach to the organization of the supply of material resources. Efficiency of the supply service at the enterprise. Features of the supply service at the enterprise. Efficiency of material and technical support. Organization of the supply system. Dependence of the supply organization on the type and size of the enterprise. Benefits of centralized procurement. Material and technical support. Features of material and technical support. The most important prerequisites for the special importance of procurement processes for the formation of the economy of enterprises. Transit form of supply. Features of the transit form of supply. The main advantages of the transit form of supply. Warehouse form. Features of the warehouse form of supply. The main purpose and advantages of the warehouse form of supply. Planning of material and technical support. Types of procurement planning for basic planning. Procurement planning process. Logistics systems focused on planning resource needs.

### **Topic 25. Purchasing activity**

Purchasing activity: definition, purpose, main tasks. The essence and features of purchasing activity. Purpose and tasks of purchasing activity. Factors affecting purchasing activity. Factors affecting the consumer's purchase of material and technical resources. Classification of procurement types. Determination of material needs. Basic systems for determining material needs. Determination of needs based on orders. Planned identification of needs based on costs. Make or buy task. The essence of Make-or-Buy Problem (MOB) (task "make or buy"). Decisions in favor of production. Decisions in favor of procurement of component products.

### **Topic 26. Management of purchases and orders**



Procurement management and order placement. The essence of order management. The logistics cycle of the order and its stages. Principles of placing orders. Trade functions regarding the attraction of potential consumers and the subsequent formation of orders. Determination of order volumes. Size of the order and available methods of its determination. Order forms. The duration of the order. Frequency of placing orders. Order fulfillment period. Costs per order. Documentation of orders and deliveries. Procurement organization. Basic procurement methods. Purchase of goods in one batch. Regular purchases in small batches. Daily (monthly) purchases based on quotation information. Receiving goods as needed. Purchase of goods with immediate delivery.

**Topic 27. Selection of suppliers and organization of supply**

Supplier selection. Importance of supplier selection. The main stages of supplier selection.

Criteria and methods of supplier selection. Basic and additional supplier selection criteria. Stages of studying potential suppliers and their capabilities. Information related to the activities of resource providers. Organization of interaction with the supplier. Integration of actions between the supplier and the enterprise. Improvement of relations with the supplier. Choice of terms of delivery. Supply control.

**Topic 28. Technology of decision - making and documentation during the organization of purchases**

Technology of decision-making during the organization of purchases and placement of orders. The main functions of the procurement process. Order placement efficiency. Technology and principles of contracting. The essence and types of contracts. The main elements of the contract and features of conclusion. Information support for order management. The importance of information support for order management. Sources of information collection.

Methodology for calculating supply and procurement indicators. Analysis of procurement processes. Management analysis of procurement processes. Organization of product delivery.

The main actions related to the organization of delivery. Choice of methods of delivery of materials.

**Content module 7 . Sales logistics**

**Topic 29. Sales policy of the enterprise**

Sales management. Organization of the sales system. Ways of selling products. Sales policy of the enterprise. The sales policy of the enterprise - the manufacturer of products. The main elements of sales policy. The main functions of logistics in sales. Organization of wholesale trade. The essence of wholesale trade. The main tasks of wholesale trade. Peculiarities of the organization of wholesale trade.

Electronic trade. The essence of electronic commerce. The main tasks of e-commerce. Peculiarities of electronic trade organization. Retail. The essence of retail

trade. The main tasks and functions of retail trade. Peculiarities of the organization of retail trade. Calculation of sales figures. Determination of the main sales indicators. Analysis of the main sales indicators.

**Topic 30. The essence of distribution logistics**

Purpose, tasks and functions of distribution logistics. The essence of distribution logistics. An integrated view of the distribution function. Composition of distribution logistics tasks at the micro- and macro-level. Logistics and marketing. Relationship of marketing and logistics. Common interests of marketing and logistics. Basic forms of organization of distribution logistics. Forms of organization of distribution logistics. Features of the resource distribution planning system - Distribution Resources Planning. The main systems of distribution of goods. Problems in the field of distribution. Distribution logistics. Choosing a distribution strategy.

**Topic 31. Distribution channels in logistics**

Wholesale and logistics intermediaries in the distribution system. Types and functions of logistics intermediaries in distribution channels. Internal structure and principles of functioning of distribution channels. The essence of sales channels. Peculiarities of distribution channel structures and principles of their functioning. Development of the distribution channel structure. Selection of distribution channels. Direct and indirect distribution channels. Peculiarities of developing the structure of sales channels. Formation of a distribution network. Distribution of goods. Methods of building a distribution network.

The list of practical and laboratory studies in the course is given in table. 2

Table 2

**The list of practical and laboratory studies**

Name of the topic and / or task	Content
Topic 1. Practical study 1.	Mechanized cargo handling systems in the warehouse and during transportation. Calculation of efficiency indicators.
Topic 2. Laboratory study 1.	Containerization of cargo. Labeling of containers and products.
Topic 3. Practical study 2.	Peculiarities of construction of logistic information systems.
Topic 4. Laboratory study 2.	Principles of organization of information flows in the logistics system.
Topic 5. Practical study 3.	Information systems and technologies in logistics.
Topic 6. Laboratory study 3.	Choosing the optimal mode of transport.
Topic 7. Practical study 4.	Types of deliveries and technological schemes of transportation.
Topic 8. Laboratory study 4.	Criteria for evaluating the efficiency of the transport process.

Topic 9. Practical study 5.	Calculation of technical and operational indicators of motor vehicles on routes.
Topic 10. Laboratory study 5.	Choosing the best carrier. Tariffs for transportation.
Topic 11. Practical study 6.	Choosing the optimal mode of transportation.
Topic 12. Laboratory study 6.	Formation of production and supply schedules.
Topic 13. Practical study 7.	Solving organizational aspects of production logistics
Topic 14. Laboratory study 7.	
Topic 15. Practical study 8.	Selection of production location.
Topic 16. Laboratory study 8.	The main indicators of production logistics.
Topic 17. Practical study 9.	Optimization of the inventory management system based on Zevakov's methodology. Inventory rationing, inventory management systems in conditions of financial restrictions and shortages.
Topic 18. Laboratory study 9.	
Topic 19. Practical study 10.	Determining the indifference freight turnover of the warehouse,
Topic 20. Laboratory study 10.	Using the Pareto method to decide on the placement of goods in the warehouse,
Topic 21. Practical study 11.	Warehouse planning.
Topic 22. Laboratory study 11.	
Topic 23. Practical study 12.	
Topic 24. Laboratory study 12.	Determining the optimal order size.
Topic 25. Practical study 13.	Determination of the optimal procurement strategy
Topic 26. Laboratory study 13.	Evaluation of the supplier based on the results of the work in order to make a decision on the extension of the contractual relationship with them
Topic 27. Practical study 14.	
Topic 28. Laboratory study 14.	Evaluation and selection of a distribution system
Topic 29. Practical study 15.	Determination of the location of the distribution warehouse taking into account the economic criterion of optimization
Topic 30. Laboratory study 15.	The method of complete search.
Topic 31. Practical study 16.	The method of determining the center of gravity

The list of self-studies in the course is given in the table. 3.

Table 3

## List of self-studies

Name of the topic and / or task	Content
Topic 1 - 31	Study of lecture material, legislative and regulatory acts
Topic 1 – 31	Preparation of practical and laboratory works
Topic 1– 31	Writing a research paper
Topic 1 – 31	Preparation for control works

The number of hours of lectures, practical and laboratory studies, and hours of self-studies is given in the technological card of the course.

## TEACHING METHODS

In the process of teaching the course, in order to acquire certain learning outcomes, to activate the educational process, it is envisaged to use such teaching methods as:

Verbal: lecture (Topic 1 – 6, 8–31), problem lecture (Topic 7), group work (Topic 5), case technologies (Topic 26), situational tasks (Topics 29, 30, 31).

Visual (demonstration (Topic 1-31).

Practical (practical and laboratory work (Topic 1-31), research work (Topic 1-31).

## FORMS AND METHODS OF ASSESSMENT

The University uses a 100-point cumulative system for assessing the learning outcomes of students.

**Current control** is carried out during lecture, practical and laboratory classes and is aimed at checking the level of readiness of a higher education applicant to perform a specific job and is evaluated by the sum of points scored:

– for course with a form of semester control as an exam: the maximum amount is 60 points; minimum amount required is 35 points.

**The final control** includes the semester control and assessment of the student.

**Semester control** is carried out in the form of a semester exam (exam).

The maximum number of points that a student of higher education can receive during the examination (examination) is 40 points. The minimum amount for which the exam is considered passed is 25 points.

**The final grade in the course** is determined:

for disciplines with a form of exam, the final grade is the amount of all points received during the current control and the exam grade.

During the teaching of the course, the following control measures are used:

Current control: test surveys on lecture topics (10 points), written control work

(30 points), experimental work (5 points), practical and laboratory works (15 points).

Semester control: Grading including Exam (40 points).

More detailed information about the assessment system is provided in the technological card of the course.

An example of an exam card paper and assessment criteria.

### **An example of an exam card**

Simon Kuznets Kharkiv National University of Economics

First (bachelor) study cycle

"Management" specialty

Study programme "Logistics".

Course "Functional logistics"

#### **EXAM CARD No. 1**

##### **Test tasks**

1. Which answer correctly reflects the hourly productivity of the conveyor during the movement of goods? It is known that the weight of the artificial load = 40 kg, the distance between the artificial loads is 2 m, the speed of the conveyor is 15 m/s:

- a) 1,100 t/h;
- b) 1,080 t/h;
- c) 1,000 t/h;
- d) 1,195 t/h?

2. Equalization of the duration of technological operations is a requirement of the law:

- a) calendar synchronization of the duration of technological operations;
- b) orderly movement of objects of labor in production;
- c) rhythm of the production cycle of order fulfillment;
- d) resource reservation in production.

3. Compliance with the "golden ratio" rule is a requirement of the law:

- a) calendar synchronization of the duration of technological operations;
- b) orderly movement of labor items in production;
- c) rhythm of the production cycle of order fulfillment;
- d) resource reservation in production.

4. The most progressive method of modeling the rhythm of the production cycle of product manufacturing is:

- a) statistical;
- b) static;
- c) dynamic;
- d) there are no correct answers.

5. For a small volume of production, the optimal is:

- a) manual technology;
- b) automated technology;
- c) automatic technology;
- d) mechanized.

6. What costs are affected by the size of the production lot:

- a) preparatory and final costs;
- b) inventory costs in ;

- c) storage costs;  
d) are all the answers correct?  
7. This option allows some loss in the duration of the technological process, but concentrates free time on individual technological operations:  
a) parallel;  
b) combined;  
c) consecutive ;  
d) there are no correct answers.

### Task 2

The largest producer of domestic polyethylene is the "Orlana" concern. Using the given data on supplies, costs and balances of raw materials in one of the warehouses of the enterprise, determine the rate of insurance stock.

data , thousand t

Date of operation	Arrival, t	Expenses, i.e
1	2	3
01.01	–	The balance is 65.5
19.01	165.5	83.7
18.02	–	28.4
10.02	77.5	–
22.03	78.0	–
20.04	–	21.0
06.05	39.0	12.0
20.06	–	77.5
25.06	79.0	27.5
08.07	38.0	38.0

### Task 3

Choose a carrier based on the cost method and the abstract carrier method.

Indicator	Translated by 1	Translated by 2
Number of goods transported per year , units.	7,200	7,200
Market value of the product, hryvnias	120	120
The cost of delivery per product unit (taking into account tariffs for transportation, loading, unloading, etc.), UAH	7,8	8.1
Average time required to complete delivery, years	0.0045	0.0051
Average time between shipments of goods, years	0.009	0.0091
The cost of delivering a unit of goods per year (taking into account the interest rate, fines for spoilage), UAH	8,9	9.0
The cost of placing an order for one shipment, hryvnias	21	19.5
Annual cost of storage, money. unit	3,400	3,500
Costs for purchasing a unit of goods, hryvnias	90	90

Protocol No. \_\_\_\_ dated " \_\_\_\_ " \_\_\_\_\_ 20 \_\_\_\_ was approved at the meeting of the Department of Management, Logistics and Innovation.

Examiner

Assoc. Prof. Kolodizeva T.O.

### Evaluation criteria

**The final marks for the exam** consist of the sum of the marks for the completion of all tasks, rounded to a whole number according to the rules of mathematics.

The algorithm for solving each task includes separate stages that differ in complexity, time-consumingness, and importance for solving the task. Therefore, individual tasks and stages of their solution are evaluated separately from each other as follows:

**Task 1 (test). (14 points)**

For each correct test - 2 points.

**Task 2 (diagnostic). (10 points)**

4 – calculated material balances for each date;

2 – the insurance reserve is calculated in time units;

2 – the insurance reserve is calculated in physical units;

2 - a schedule of the dynamics of material resource balances is provided.

**Task 3 (heuristic). (16 points)**

6 – the carrier is selected by the cost evaluation method;

6 – the carrier is selected using the abstract carrier method ;

4 – a comparison of methods and conclusions regarding the selection of the optimal carrier are made.

## RECOMMENDED LITERATURE

### Main

1. Колодізева Т. О. Управління ланцюгами поставок: навчальний посібник / Т. О. Колодізева. – Харків : ХНЕУ ім. С. Кузнеця, 2016. – 164 с. Режим доступу: <http://www.repository.hneu.edu.ua/handle/123456789/14815>

2. John J. Supply Chain Management: A Logistics Perspective/John J. Coyle Jr. Langley C. John Robert A. Novack Brian J. Gibson. – Cengage Learning 20, Channel Center Street Boston, MA02210 USA, 2016. – 639 p.

### Additional

3. Kolodzieva T. Assessment of logistics service quality based on the application of fuzzy methods modeling / T. Kolodzieva, E. Zhelezniakova, K. Melnykova et al. // Problems and Perspectives in Management. – 2022. – No. 20 (3). - P. 552-576 . [Electronic resource]. - Access mode: <http://repository.hneu.edu.ua/handle/123456789/28191>

4. Колодізева Т. О. Перспективи впровадження блокчейн-технології в транспортну логістику та управління ланцюгами поставок. Бізнес Інформ. 2023. №6. С. 184–190. <http://repository.hneu.edu.ua/handle/123456789/30071>

## Information resources

5. ULA Ukrainian Logistics Alliance [Electronic resource]. - Access mode: <http://ula-online.org/ua/>
6. ELA, the European Logistics Association [Electronic resource]. - Access mode: <http://www.elalog.eu/>
7. Site PNS S. Kuznets HNEU, discipline “Functional logistics I” [Electronic resource]. - Access mode: <https://pns.hneu.edu.ua/course/view.php?id=7724>
8. Site PNS S. Kuznets HNEU, discipline “Functional logistics II” [Electronic resource]. - Access mode: <https://pns.hneu.edu.ua/course/view.php?id=7726>