EDUCATIONAL INSTITUTION BREST STATE TECHNICAL UNIVERSITY

FACULTY OF ECONOMICS

DEPARTMENT OF ECONOMIC THEORY AND LOGISTICS

AGREED

Head of the Department

_____G.B.Medvedeva

«14» 02 2025 г.

AGREED

Dean of the Faculty

_____V.V. Zazerskaya

«14» 02 2025 г.

ELECTRONIC EDUCATIONAL AND METHODOLOGICAL COMPLEX

for the academic discipline "TRANSPORT AND TRANSPORT SYSTEMS"

for specialties

7-06-0412-03 Logistics

Compiled by Eremina L.V.

Considered and approved at the meeting

of the Scientific and Methodological Council of BSTU

"31" 03 2025, No 3

рег. № УИР 24/128-65

LIST OF MATERIALS IN THE COMPLEX

Electronic educational and methodical complex Transport and transport systems for the specialty 7-06-0412-03 Logistics contains:

EXPLANATORY NOTE

The electronic educational and methodological complex (EEMC) for the academic discipline "Transport and Transport Systems" was created in accordance with the requirements of the Resolution of the Ministry of Education of the Republic of Belarus dated July 26, 2011 No. 167 "On approval of the provisions on educational and methodological complexes at the levels of basic education and is intended for students of economic specialties.

The EEMC for the discipline "Transport and Transport Systems" was developed for students receiving advanced higher education (Master's degree) in the specialty Logistics in English. The EEMC is aimed at improving the efficiency of the educational process and organizing the integrity of the system of educational and subject activities in the discipline "Transport and Transport Systems", which is one of the most important areas of strategic innovation in education. The EEMC contributes to the successful assimilation of educational material by graduate students, provides an opportunity to plan and carry out independent work, ensures a rational distribution of study time on the topics of the academic discipline and improves the methodology of conducting classes. The structure of the EUMC takes into account the latest achievements in the field of pedagogy and information technology and guides graduate students in acquiring relevant professional competencies.

The content of the sections of the EUMC corresponds to the educational standards of these specialties, the structure and topics of the curriculum for the discipline "Transport and Transport Systems".

Objectives of the EUMC:

• improving the efficiency of the educational process

• introducing advanced technologies for storing and transmitting information in electronic form.

The structure of the EUMC includes:

1. The theoretical section, consisting of lecture notes on the discipline "Transport and Transport Systems" on the main topics of the course.

2. The practical section, which presents materials for practical classes of students and performing laboratory work.

3. Knowledge control, presented by questions to prepare for the exam, assignments for midterm assessment.

For students of the correspondence course, the course program provides for passing a test and an exam.

The test is submitted by students of the correspondence course in the form of solved assignments on the topics of the discipline.

4. Auxiliary section of the EUMK, presented in the form of a curriculum for the academic discipline "Transport and Transport Systems" and a list of publications recommended for study. Recommendations for organizing work with the EUMK: an IBM PC-compatible PC of standard configuration is required.

1. AUXILIARY SECTION

COURSE DESCRIPTION:

The objective of this course "**Transportation and Transportation Systems"** is for students to obtain knowledge of the field of terminal maintenance of logistics systems. **Author: Liubov V.Eremina**

The course will extend students' knowledge and understanding in the field of logistics services of terminal systems and the quality of terminal service

Students get acquainted with the main directions of terminal service development

REQUIREMENTS: During this course the level of knowledge and skills obtained by the students will be measured by using case studies, tests, public presentation of own project on the development of terminal service.

During this course the student will write a research essay on the topic of modern terminal service of 30 pages, test will contain about 3 opened problematic issues.

The student also will prepare final public presentation. Students can choose the topic. It's critically important to follow deadlines.

The grade for the final research paper and its presentation is 40% of the final grade. The remaining 60% of the grade will be based on class activities – including discussions, reflecting, short papers, essays, presentations as well as general participation in each session of class.

Most of the readings and educational materials for the course are internet sites, open web-sources, video lectures and also text-books and monographs and journal articles. The additional reading strongly recommended in order to extend students professional skills and improve their knowledge in communication challenges.

As a result of studying the academic discipline "Transport and transportation systems" **students should know**:

organization and technology of transportation, determination of the need for the development of the transport network, rolling stock;

methods and rules of use of loading and unloading equipment, working conditions;

basic principles of organization and methods of implementation of technical protection of information;

methods of determining the efficiency of transportation means and loading and unloading equipment;

requirements to operational properties of transportation means;

the basics of normative-technical and organizational fundamentals of the organization of the transportation process and ensuring the safety of vehicle traffic in various conditions.

be able to:

analyze the state of transport provision of cities and regions;

use basic principles and methods of engineering and technical information protection;

to apply the basics of organization of transportation process and traffic safety in different conditions;

to choose the rolling stock and loading and unloading means for specific operating conditions**.**

possess:

skills of forecasting the development of regional and interregional transportation systems;

the basics of the transportation process and ensuring the safety of vehicle movement, skills of rational interaction between different types of transport, methods of selecting the optimal type of rolling stock for cargo transportation according to the criteria of safety and security;

ability to analyze socially significant problems and processes when analyzing aspects and trends of modern motorization development;

skills of working with professional hardware means of engineering and technical protection of information, rules of loading and unloading operations and cargo storage.

Learning and Teaching		
Learning Activities The learning activities undertaken to achieve the course learning outcomes are stated below:	**Categories**	**StudentLearningHours**
Lecture Content Delivery	Scheduled	22
Tutorial/Synchronous Support Activity	Scheduled	16\12
Independent Study	Independent	56
		100 HoursTotal

Curriculum:

Themes	*Subthemes*	*Time (hours)*
Unit 1. Supply Chain Management	1. The emergence of the supply chain concept 2. The definition of supply chain management 3. The components of supply chain from the focal firm's perspective 4. Characteristics of supply chain management 5. Challenges of supply chain management 6. Reading Material	16
Unit 2. Recent Trendsin Logistics	1. Third-party logistics 2. Outsoursing 3. Global logistics 4. Virtual warehousing 5. Reverse logistics	12

	6. Benchmarking 7. Reading Material	
Unit 3. The Development of Logistical Integration	1. Integrated logistics concept 2. Why should logistics activities be integrated? 3. Logistical integration objectives 4. The development of logistical integration 5. Reading material	16

Learning Outcomes

Unit 1	Upon successful completion of this unit, the student will be able to: • Apply study and analyze the necessary management information • Explain to systematize them and to generalize, to use at management of programs of development of new technologies of transport service • Operate ensuring efficient use of production resources
Unit 2	Upon successful completion of this unit, the student will be able to: • Differentiate necessary management information, technical data • Inspect performance and results of the organization • Analyse use in the management of development programs
Unit 3	Upon successful completion of this unit, the student will be able to: • Formulate study and analyze the necessary management information • Compose to systematize them and to generalize, to use at management of programs of development of new technologies of transport service • Assess ensuring efficient use of production resources.

Issues for final control

1. What is distribution?

2. What types and attributes of products affect logistics solutions in distribution?

3. What factors determine the structure of logistics channels in distribution?

4. How can we classify the distribution system and structure of logistic channels in distribution?

5. What factors influence the choice of distribution channel and distribution system?

6. What are the main tasks of logistics management in distribution?

7. What does "customer service" mean in distribution?

8. What is the procedure for assessing the quality of logistics services in distribution?

9. How is the logistics of return flows in distribution organized?

10. What is the development of policy in the field of consumer service?

11. What are the advantages and disadvantages of different modes of transport?

12. What are the main methods of transportation?

13. Describe the main technological schemes of cargo delivery.

14. How should I choose the mode of transport in the implementation of transportation?

15. What role do freight forwarders and other logistics intermediaries play in transportation?

16. What are the criteria for selecting intermediaries?

17. What are the criteria for choosing a transport company?

18. What are the criteria for choosing a forwarding company?

19. What are the criteria for choosing a logistics operator?

20. What is the intermodal transport operator?

21. What is a multimodal transport operator?

22. What are the advantages of intermodal and multimodal transport technologies?

23. What is the complex of services of freight forwarding companies?

24. What tendency. development of freight forwarding services at the present stage?

25. What are the main provisions of the Russian legislation of freight forwarding services?

26. What are the main provisions of the international legislation of freight forwarding services?

27. What are the features of the freight forwarding company in connection with the method of transportation (mode of transport)?

28. What is the role of transport and freight forwarding companies in the development of integrated supply chain management?

29. What is a freight unit and how is it used in logistics?

30. What are the advantages of terminal transportation technology?

31. How does the intermodal / multimodal transport operator operate?

32. What are the basic principles of the intermodal / multimodal transport operator?

33. What is terminal transportation what is their role in ensuring cargo flows in ensuring cargo flows through transport corridors?

34. What is the practice of letters of credit in contracts of carriage?

35. How to calculate the cost of transportation by own transport?

36. What regulatory documents regulate the relationship between contractors in the transportation of goods?

37. How is the responsibility of the shipper in international transport determined?

Bibliography

1. Gunter H.O., Tempelmeier H. Produktion und Logistik. Berlin; Heidelberg; New York; London; Paris; Tokyo; Hong Kong; Barselona; Budapest: Springer, 1994. 302 S.
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6. Applying Logistics Technology to the Transport of Consolidated Agricultural Cargo. L. Eremina, N. Negrov // Networked Control Systems for Connected and Automated Vehicles. Lecture Notes in Networks and Systems / A. Guda (ed.). – Cham : Springer, 2023. – Vol. 510. – P. 1961–1970. – https://doi.org/10.1007/978-3-031-11051-1_202.
7. Application of distributed and decentralised technologies in the management of intelligent transport systems. L. Eremina, A. Mamoiko, G. Aohua // Intelligence & Robotics / Editor-in-Chief Simon X. Yang. – Mode of access: https://www.oaepublish.com/articles/ir.2023.09. – Date of access: 15.11.2023.

COURSE PROFILE

1	Course Title	Transportation and Transportation Systems
2	Study Program	Logistics
3	Field of study	7-06-0412-03 Logistics
4	Qualification (degree level)	Master
5	Mode of study	Full-time
6	Overall workload (ECTS)	3
7	Semester	1
8	Course type	Compulsory
9	Summative assessment	credit

10	Aims:	The discipline aims to prepare specialists in the field of organization, planning and management of transport systems of a wide profile, able to independently apply their knowledge and skills in practical and research activities in the organization and management of freight transport.
11	Competences to be developed:	SC-2 Be able to determine the necessary type of neural network, its training algorithm for solving a specific problem, train the network on the basis of a priori known information
12	Learning outcomes	Know: modern theoretical and experimental methods of mathematical and economic-mathematical models of objects and processes, professional activity in the field of training Be able to: apply modern theoretical and experimental methods, develop physical, mathematical and economic-mathematical models, explore objects and processes, Own: the ability to apply modern theoretical and experimental methods, economic and mathematical models of objects and processes
13	Bibliography	1. Gunter H.O., Tempelmeier H. Produktion und Logistik. Berlin; Heidelberg; New York; London; Paris; Tokyo; Hong Kong; Barselona; Budapest: Springer, 1994. 302 S. 2. Junemann R. Materialfluss und Logistik: Systemtechnische Grundlagen mit Praxisbeispielen. Berlin; Heidelberg; New York; London; Paris; Tokyo; Hong Kong; Barcelona; Budapest: Springer, 1989. – 762 S. 3. Kopsidis Rallis M. Materialwirtschaft: Grundlagen, Methoden, Techniken, Politik. Munchen; Wien: Hanser, 1989. 240 S. 4. Rechnerintergrierte Konstruktion und Produktion. Band 5: Produkttion-logistik. Dusseldorf: VDI Verlag GmbH, 1991. 254 S. 5. Shulte C. Logistik: Wege zur Optimierung des Material und Informationsflusses. Munchen: Valen, 1991. – 339 S.

CURRICULUM APPROVAL PROTOCOL

Name of the academic	Name of	Proposals for	Decision made by

discipline with which harmonization is required	the Department	changes in the content of the curriculum of the higher education institution in the academic discipline	the chair that developed the curriculum (with the date and number of the protocol)
Strategic logistics management	ETL		
Supply chain logistics	ETL		

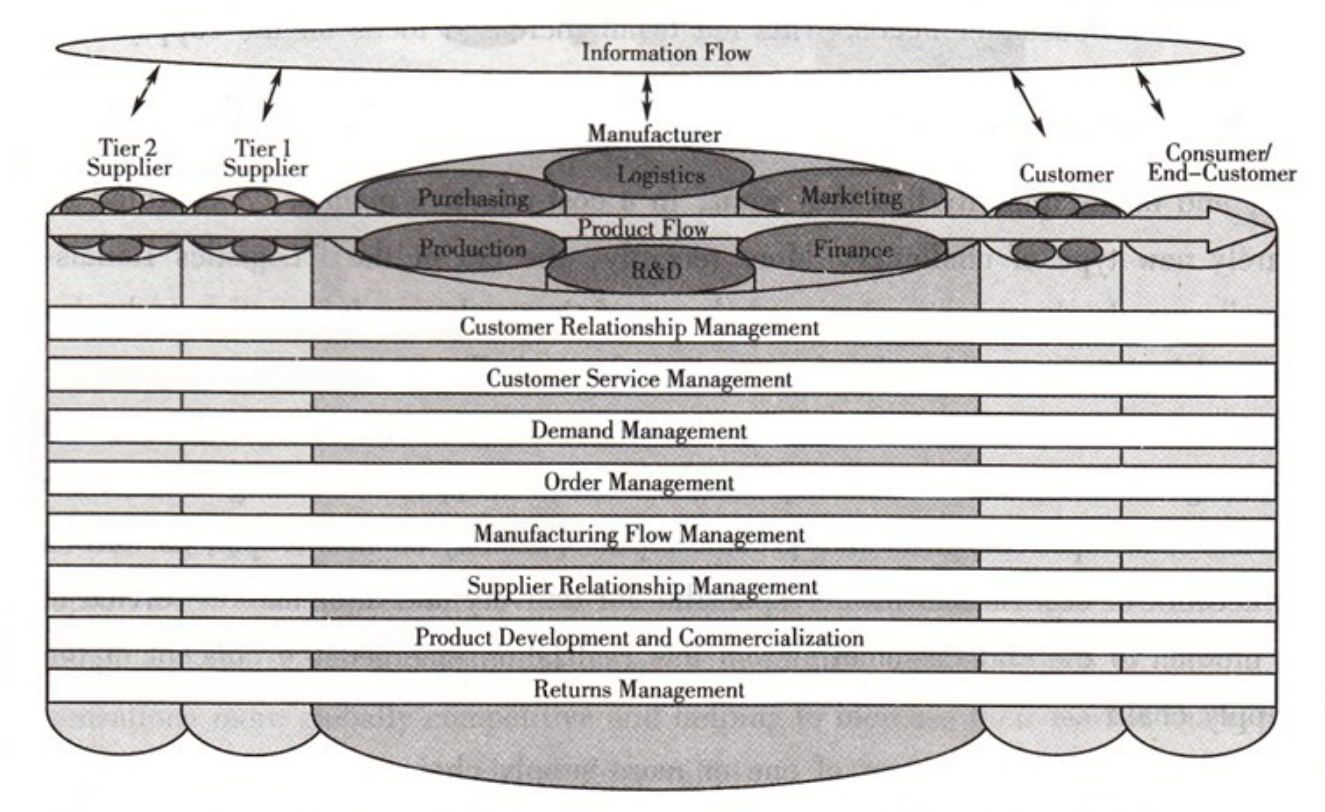
2. THEORETICAL SECTION

Lecture notes on the discipline “Transportation and transport systems”

Unit 1. Supply Chain Management

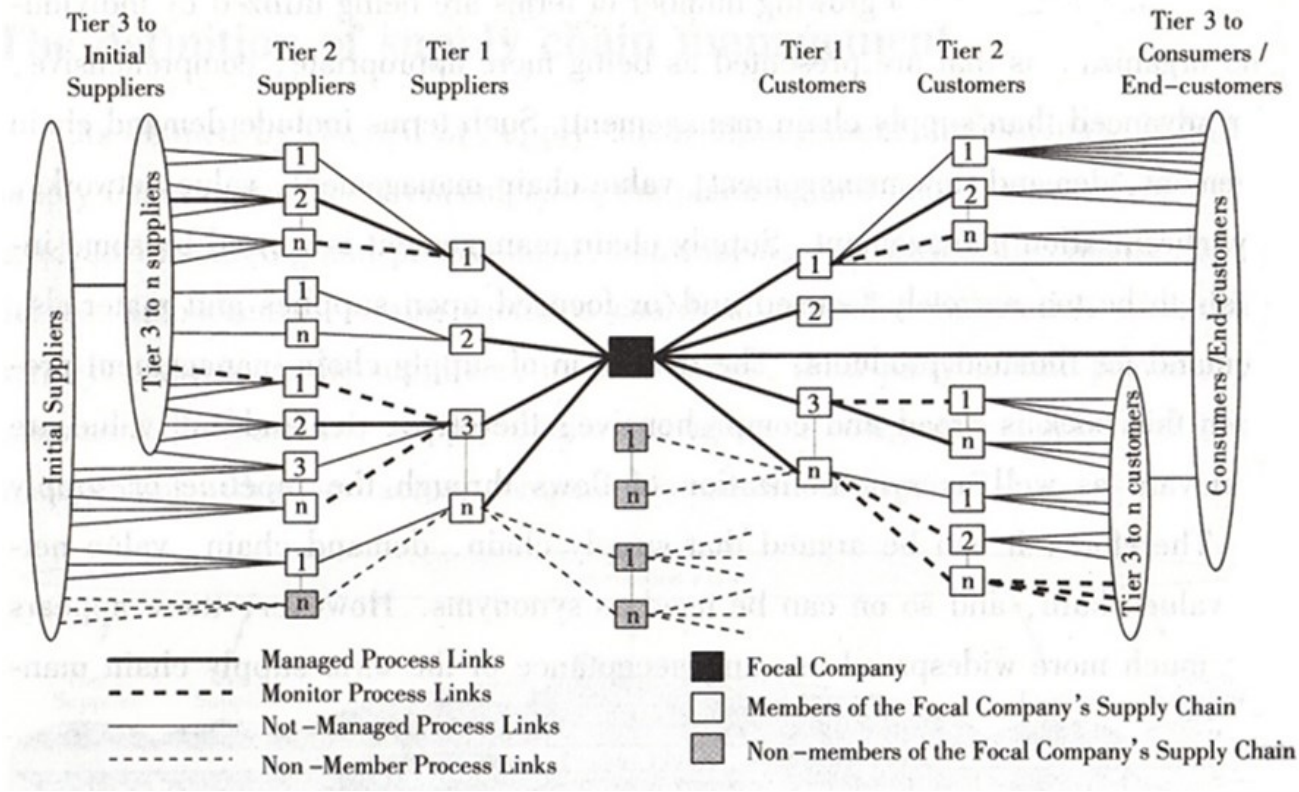
Theme 1: Transport system and management of transport systems

As defined by Council of Supply Chain Management Professionals (CSCMP), supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies as shown in Figure 2-1.



The supply chain includes the management of information systems, sourcing and procurement, production scheduling, order processing, inventory management, warehousing, customer service, and after-market disposition of packaging and materials. The supplier network consists of all organizations that provide inputs, either directly or indirectly, to the focal firm. For example, an automotive company's supplier network includes thousands of firms that provide items ranging from raw materials such as steel and plastics, to complex assemblies and subassemblies.

The definition of supply chain management presented previously suggested a number of important factors and related characteristics that are keys to successful implementation. The key factors are inventory, cost, information, customer service, and collaborative relationships. Each of these deserves some special consideration.



Customer service is a very important attribute of successful supply chains. The success of today's global supply chains is the value that they add for their ultimate customers in terms of the supply chain's landed cost/price and the related services that are provided. Information technology can play a significant role in facilitating customer service that provides the opportunity for a global supply chain to remain competitive and, hopefully, gain market share.

Collaboration among supply chain "partners" is another important ingredient to supply chain success and to the ultimate goal of integration, that is, operating the whole supply chain as if it were a single organization. Concepts such as partnerships and alliances have become a part of the vocabulary of logistics and supply chain managers and indicate that the more traditional adversarial basis to business interactions has been changing.

Theme 2: Recent Trendsin Logistics

In a word, generally, third-party providers cut across multiple logistics functions and primarily coordinate all the logistics functions and sometimes act as a provider of one or more functions. The primary objectives of third-party logistics providers are to lower the total cost of logistics for the supplier and improve the service level to the customer.

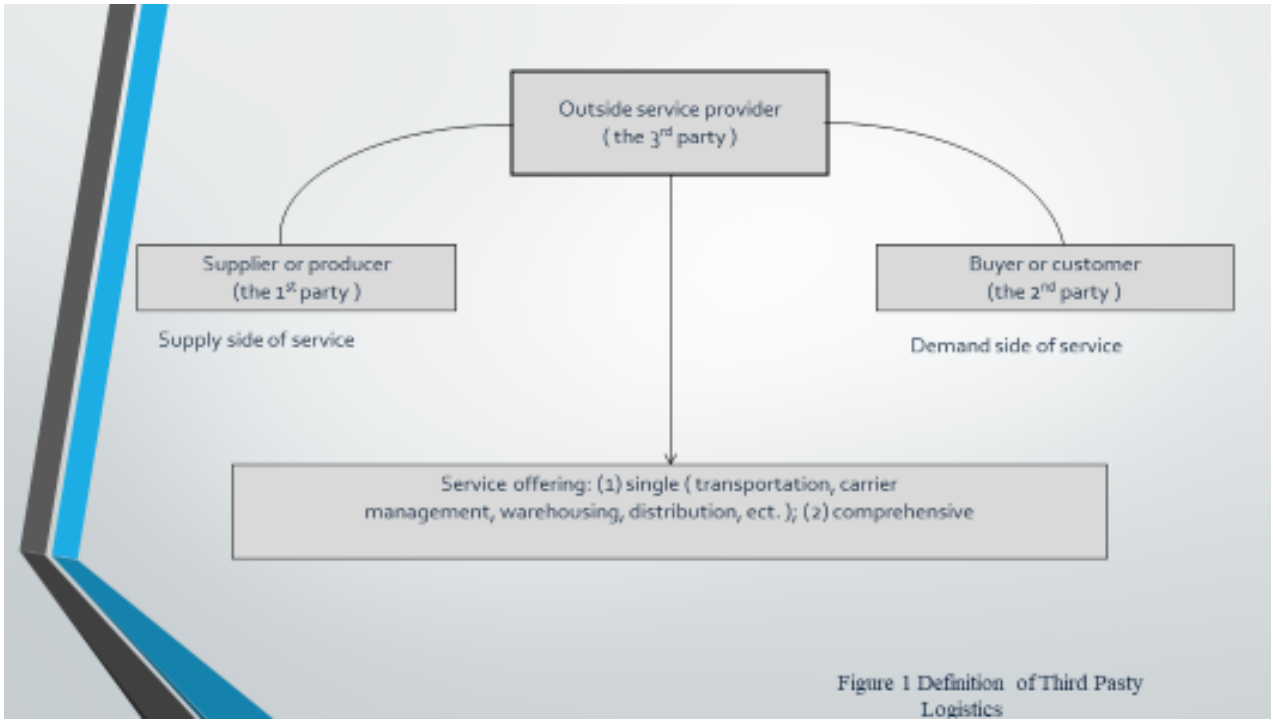
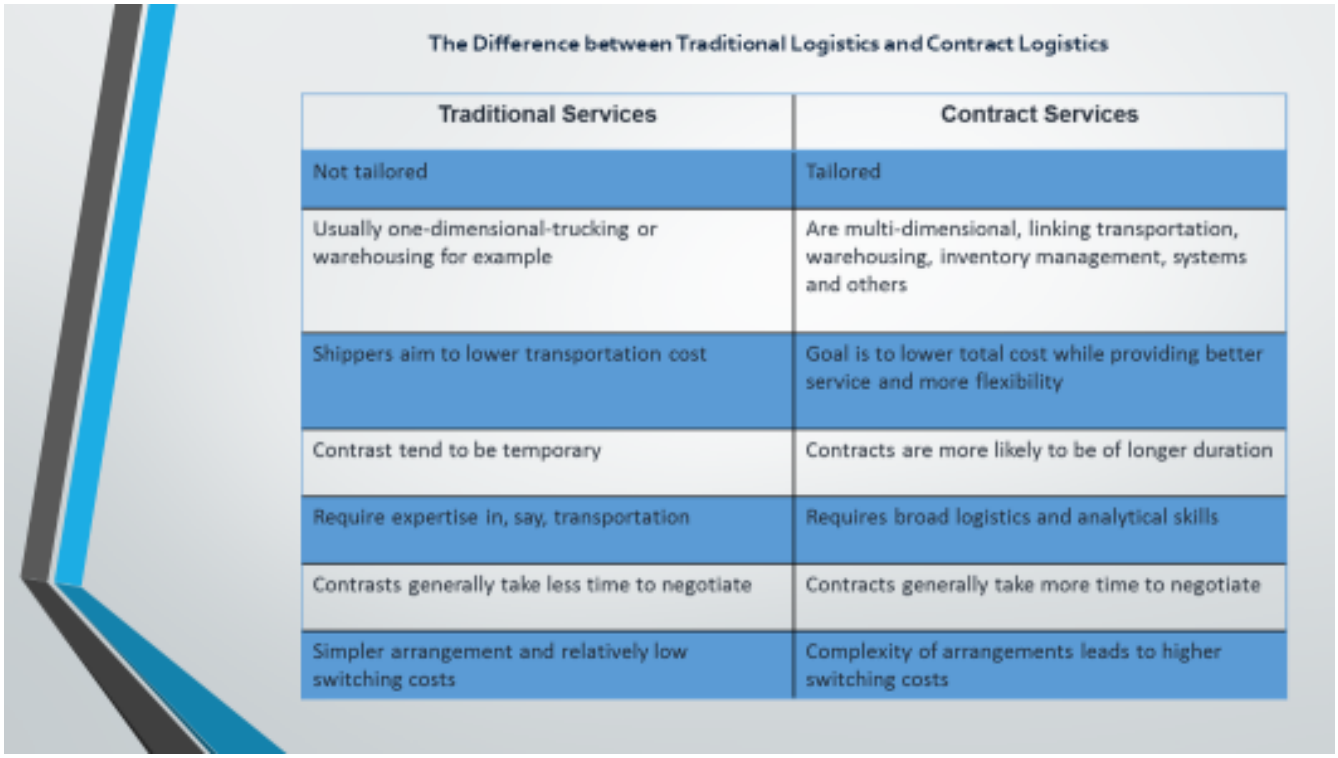


Figure 1 Definition of Third Pasty Logistics

Logistics outsourcing is defined as multiple logistics services provided by a single vendor on a contractual basis. It offers. “at least two services that are bundled and combined, with a single point of accountability using distinct information systems that are dedicated to and integral to the logistics process to provide a high level of customer satisfaction so that its clients can become a tougher competitor”.



The Difference between Traditional Logistics and Contract Logistics

Traditional Services	Contract Services
Not tailored	Tailored
Usually one-dimensional-trucking or warehousing for example	Are multi-dimensional, linking transportation, warehousing, inventory management, systems and others
Shippers aim to lower transportation cost	Goal is to lower total cost while providing better service and more flexibility
Contrast tend to be temporary	Contracts are more likely to be of longer duration
Require expertise in, say, transportation	Requires broad logistics and analytical skills
Contrasts generally take less time to negotiate	Contracts generally take more time to negotiate
Simpler arrangement and relatively low switching costs	Complexity of arrangements leads to higher switching costs

There are many drivers of outsourcing. Trunick suggests emerging technology and versatility of third parties as two other important drivers of outsourcing. Since it would be time consuming and expensive to develop and implement new technologies in-house, films can easily employ those of a third-party. On the other hand, versatility of the third parties enables them to provide an improvement in control, technology, and location, turning fixed costs into variable costs. They have the ability to reconfigure the distribution system to adjust to changing markets or technological advances.

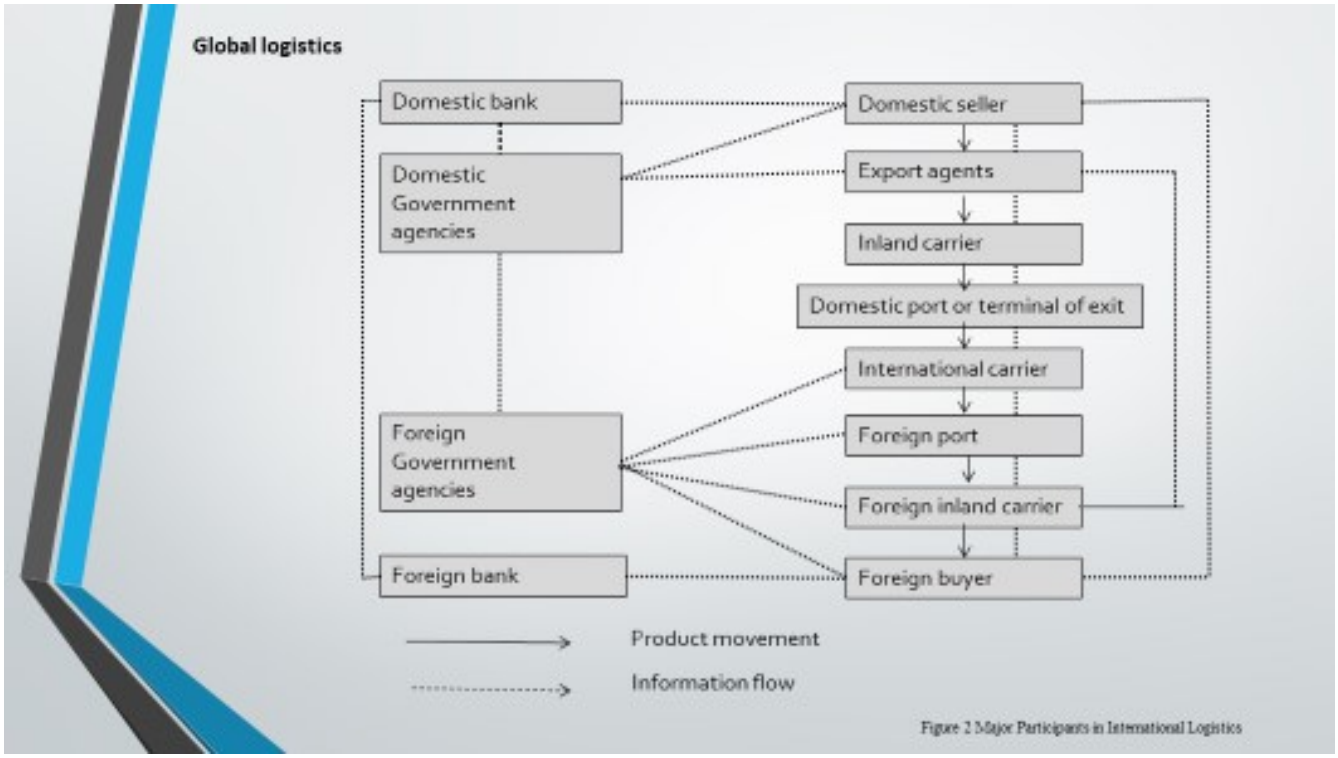


Figure 2 Major Participants in International Logistics

Material flow in global logistics is very similar to that in domestic logistics except for the fact that some of the vendors, warehouses and plants are in foreign countries. The global supply chain may require the involvement of other parties besides the seller and the buyer. The parties typically include trading companies, custom brokers, freight forwarders and customs and immigration authorities.

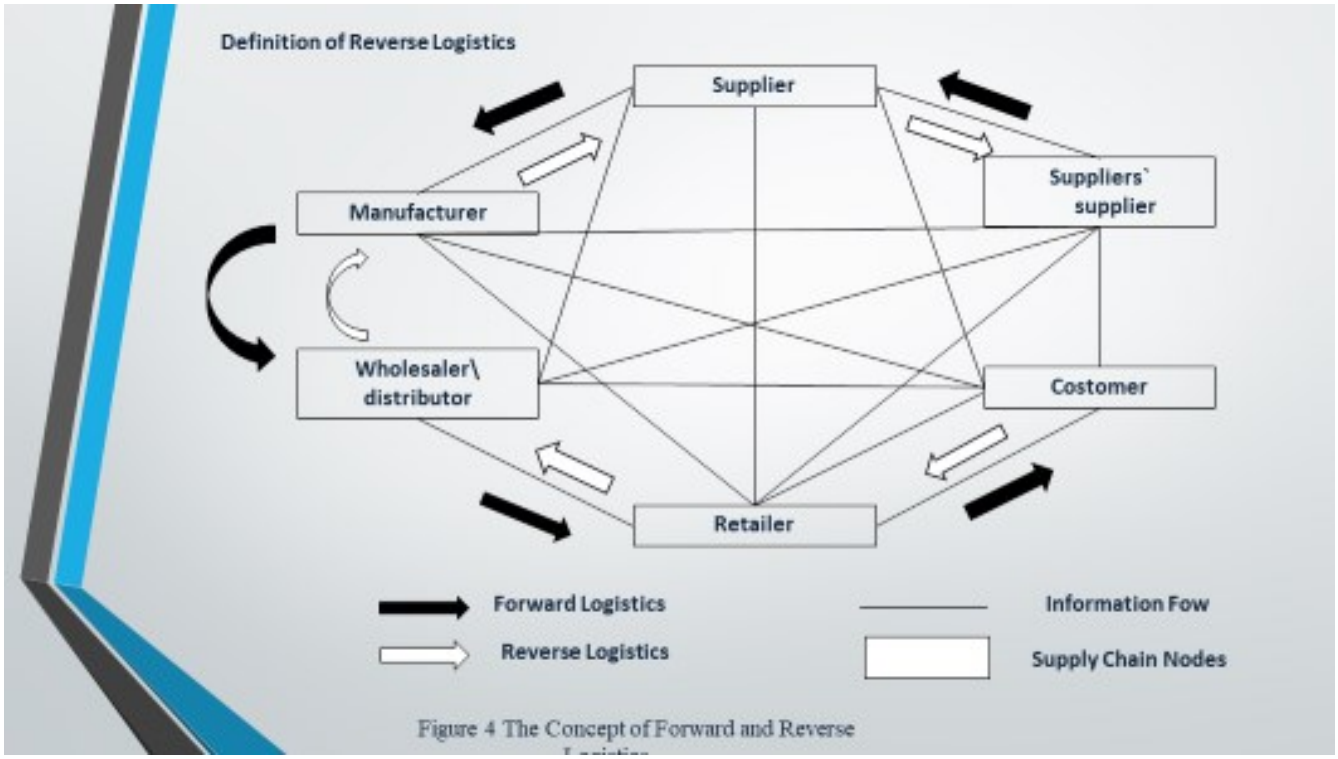


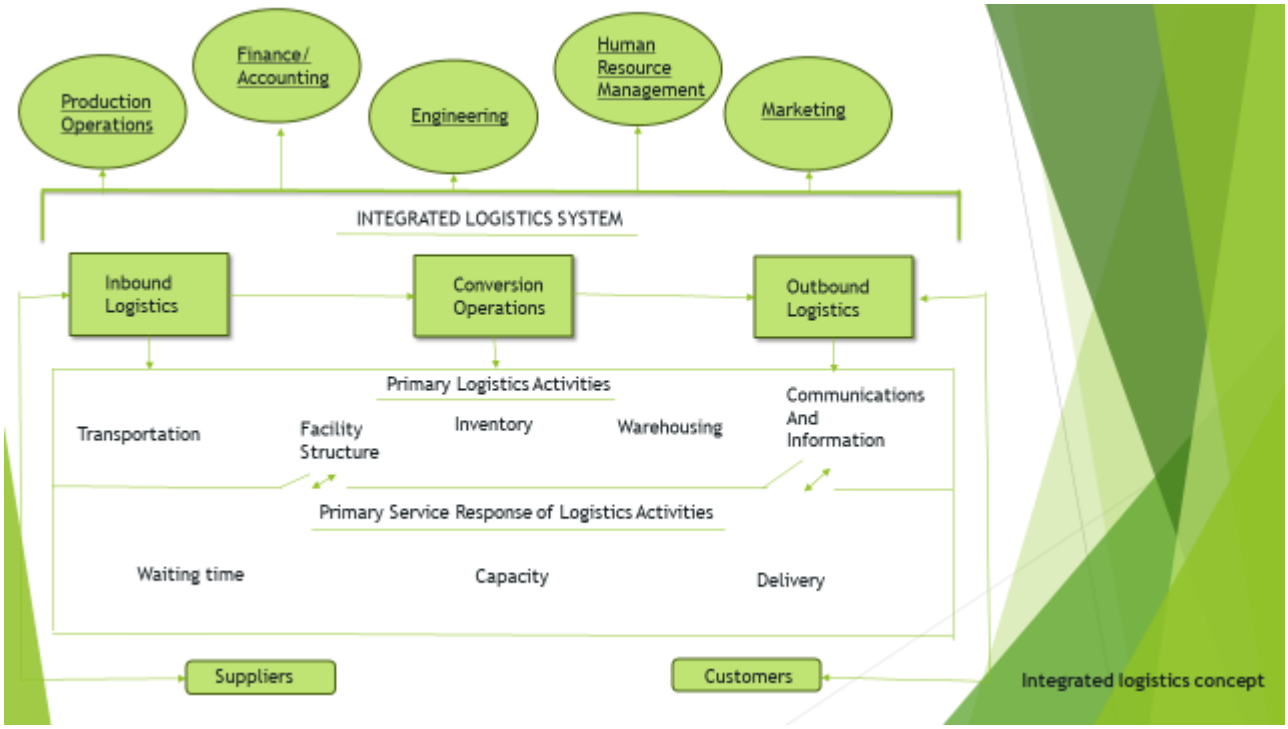
Figure 4 The Concept of Forward and Reverse

Management traditionally concentrated on improving forward logistics operations to enhance a firm's competitiveness. Forward logistics operations subsequently increase reverse logistics activities and thus its importance to an organization's success.

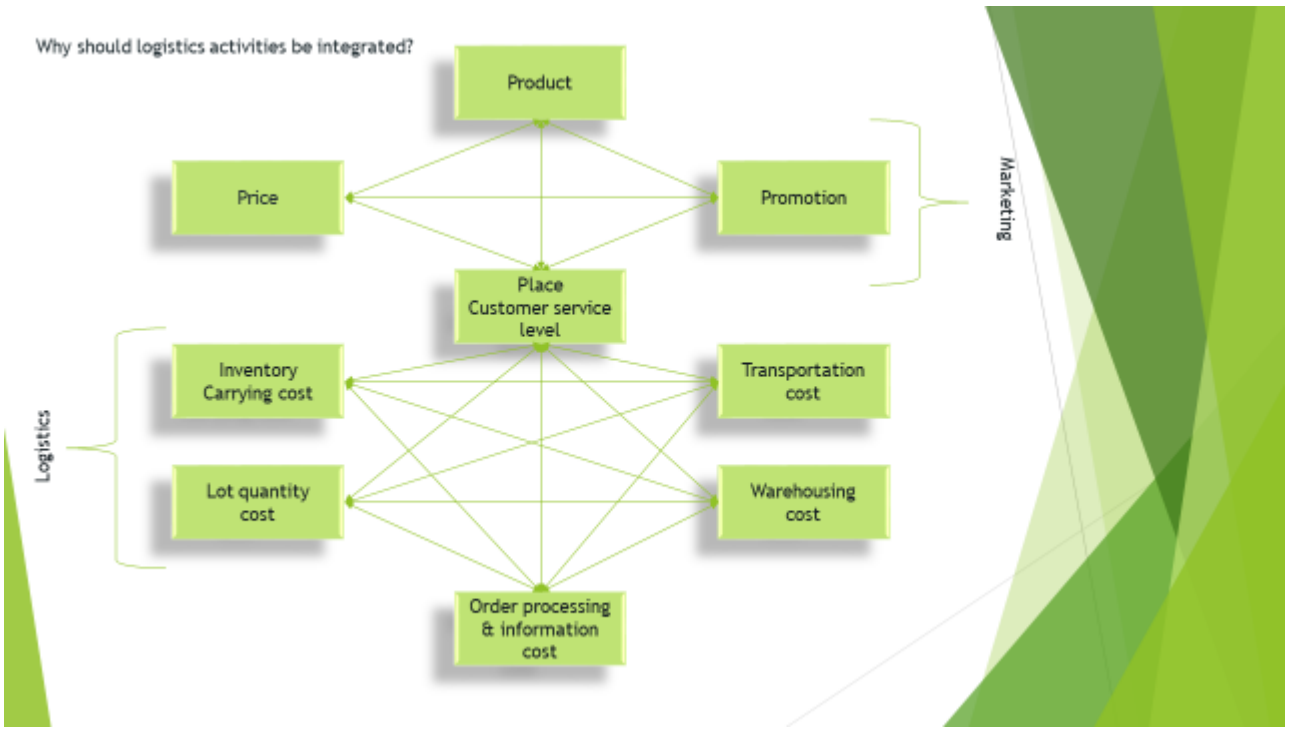
CLM defines reverse logistics as "the process of planning, implementing, and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing value or proper disposal".

Unit 2. Recent Trendsin Logistics

Theme 3: The Development of Logistical Integration



Effective operation of an integrated logistics system yields quality customer service. This arises from the integrated logistical support of operating and marketing strategies. Integrated logistics strategies may support levels of service consistent with a least cost producer strategy, or even provide the basis for differentiating the firm from competitors. Differentiation based on logistics' has been shown to provide a competitive advantage that is difficult to duplicate. Integrated logistics can also support a broader, higher service strategy. In any case, integrated logistics creates a sustainable competitive, strategic advantage.



How management allocates scarce resources to the components of the marketing mix – product, price, promotion, and place – will determine a company's market share and profitability. Management can improve a firm's competitive position by spending more dollars on the marketing mix, by allocating resources more effectively and efficiently to the individual components of the marketing mix, and/or by making changes within a component that will increase effectiveness and/or efficiencies. Figure 2 summarizes the cost trade-offs that management must make. The objective is to allocate resources to the product, price, promotion, and place components of the marketing mix in a manner that will lead to the greatest long-run profits.

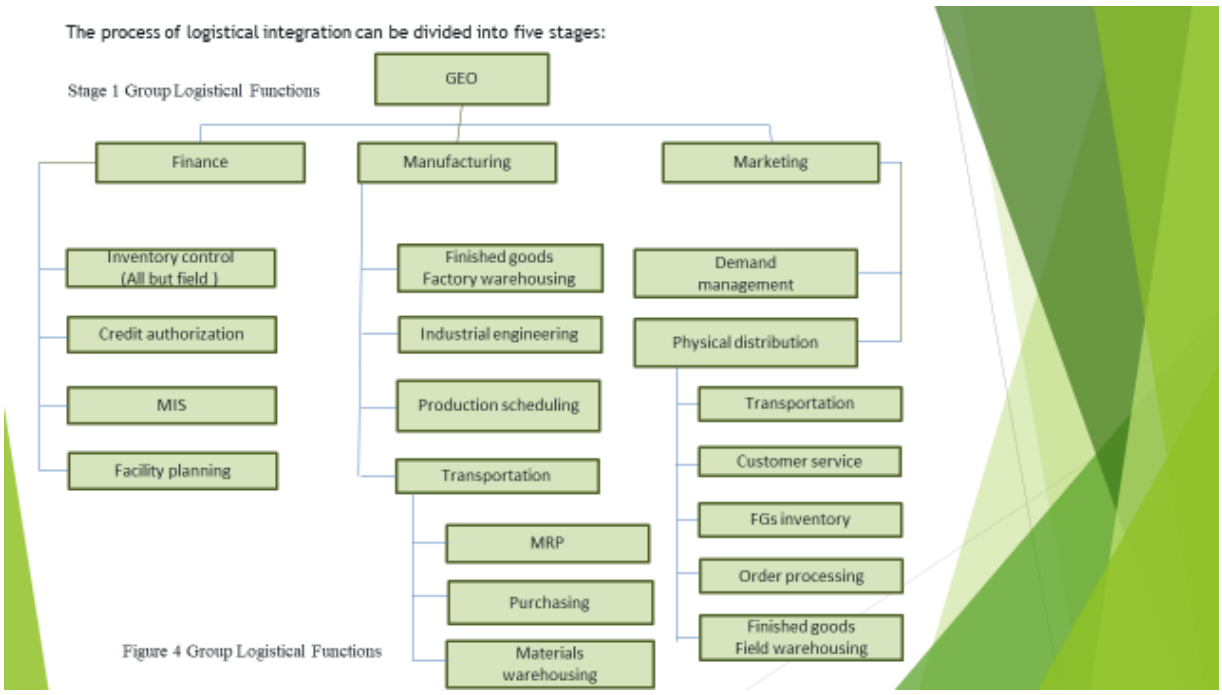


Figure 4 Group Logistical Functions

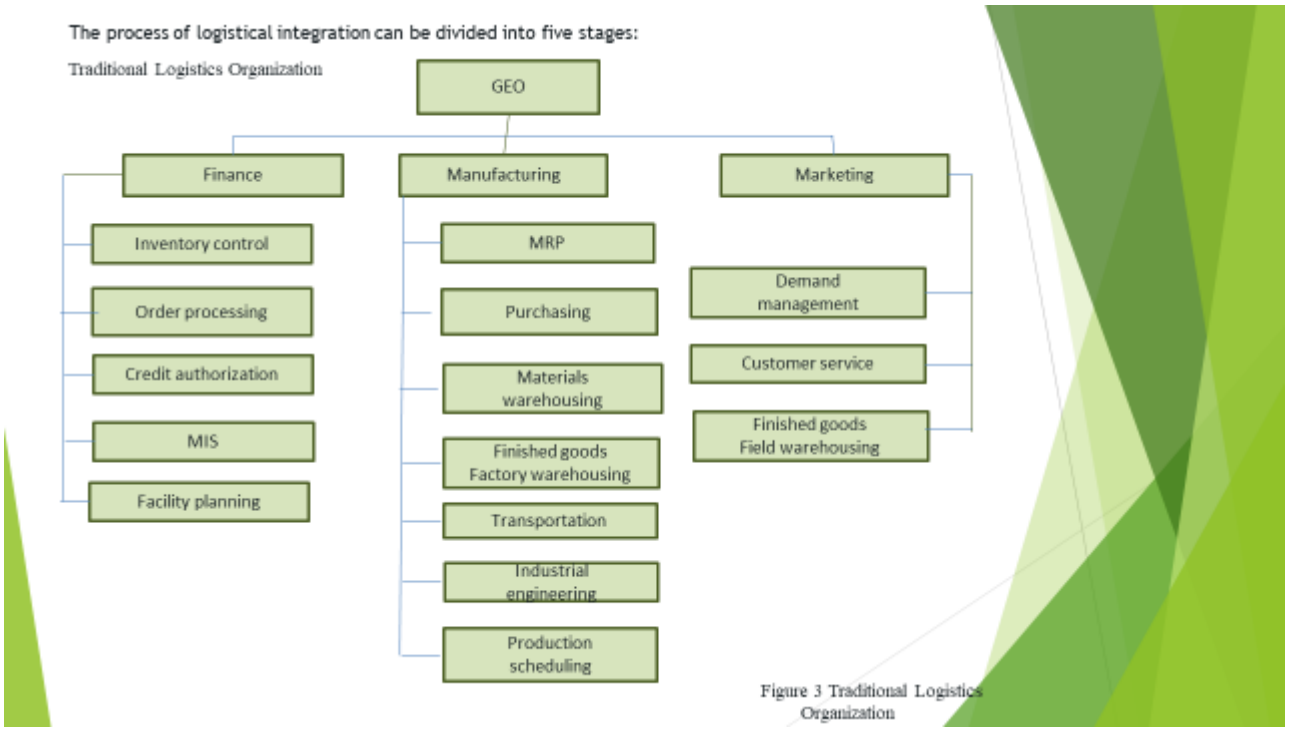


Figure 3 Traditional Logistics Organization

Traditionally, logistics organizations are fragmented. There is no integrated logistics department, and integrated logistics activities are assigned to marketing, finance/accounting, or manufacturing. Figure 3 shows an organizational chart with no integrated logistic functional area. This fragmentation reduces the benefit of an integrated logistics system. Because functional areas communicate poorly with one another, if at all. The integrated logistics activities fail to reach their potential in providing a competitive edge. Figure 4 illustrates typical stage 1 integration. For the most part, stage 1 involved grouping functions within the traditional domains of

marketing and manufacturing. In the marketing area, the grouping typically centered around customer service; in the manufacturing area, on inbound materials or parts procurement. With few exceptions, most traditional departments were not changed and the organization hierarchy was not altered significantly. The notable deficiency of a stage 1 organization was a failure to focus direct responsibility for inventory.

The process of logistical integration can be divided into five stages:

Stage 2 Physical Distribution Management

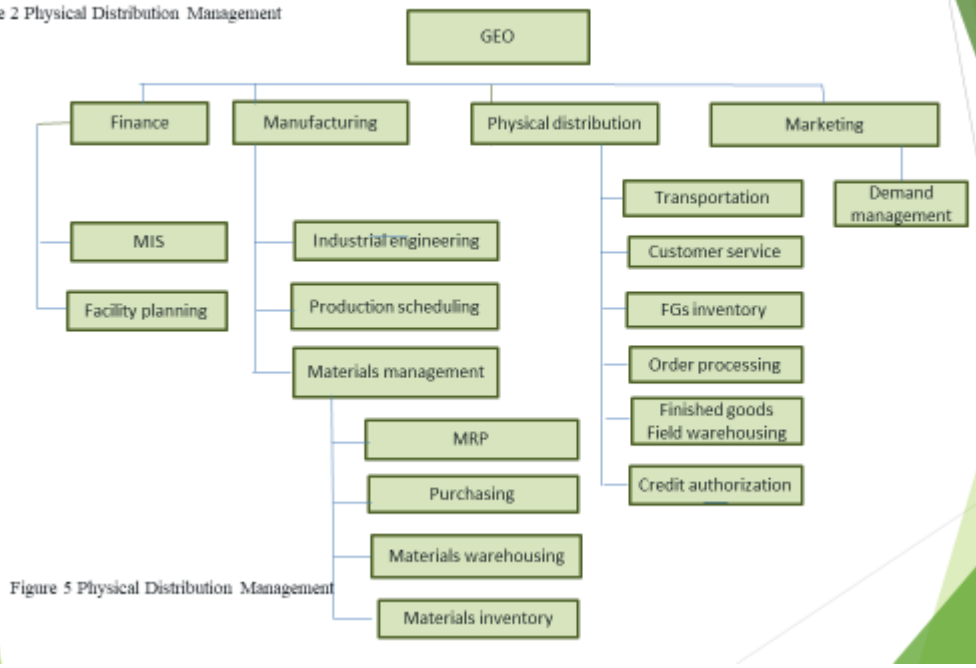


Figure 5 Physical Distribution Management

The second stage in the process is generally considered to have been the revolution in physical distribution management which began in the late 1960s and early 1970s and involved the integration into a single function of activities associated with the outbound distribution of finished goods. Figure 5 portrays this structure. Figure 6 shows the integrated functional logistics. It enabled them to exploit higher level synergies, share the use of logistical assets between inbound and outbound flows, and apply logistical principles more consistently across the business. The term “integrated logistics” was used to describe the coordination of supply, production, and distribution. The culmination of this process was called “total logistics” that logistics extends its influence upstream into product development and downstream into after-sales service and the recycling and disposal of waste. Figure 6 portrays this structure.

The process of logistical integration can be divided into five stages:

Stage 3 Functional integration

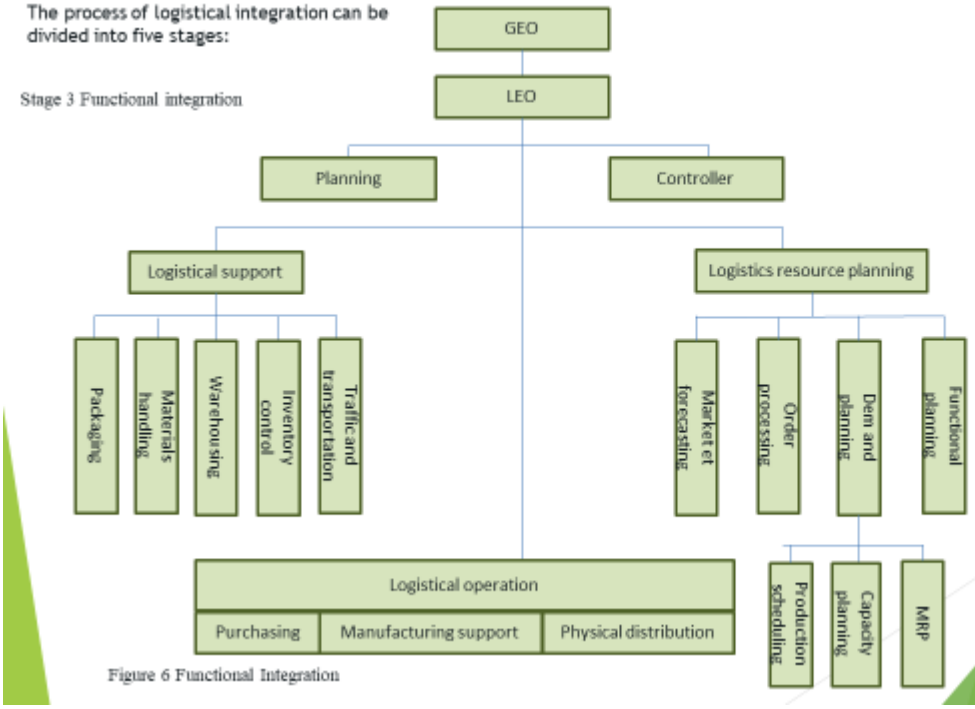


Figure 6 Functional Integration

Notes

- 1. When a manufacturer demands faster payment of accounts receivable, provides a discount for early payment, or otherwise changes the financial terms of sale, it is changing the price of its products, and such changes may affect demand.
- 2. Effective management and real cost savings can be accomplished only by viewing logistics as an integrated system and minimizing its total cost given the firm's customer service objectives.
- 3. Many businesses are endeavoring to integrate supply networks that traverse the globe, comprise several tiers of supplier and distributor, and use different transport modes and carriers.
- 4. Members of an integrated supply chain should collaborate to maximize vehicle load factors, minimize empty running, achieve an optimal allocation of freight between modes, and standardize on handling systems that make effective use of vehicle and warehouse capacity.
- 5. The transition to system integration (internal integration) involves primarily a change in organizational structure, while to attain SCM (external integration), management must undergo a major attitudinal change.

Unit 3. The Development of Logistical Integration

Theme 4: Transportation and transport systems

We have 6 modes of transportation - road, rail, air, water (river and sea) and pipeline.

Product's Characteristics

Distance

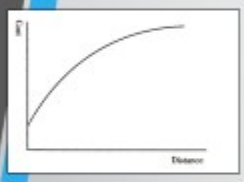


Figure 2 Relationship between Cost and Distance

Volume

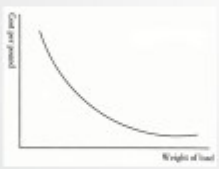


Figure 3 Relationship between Volume and Cost

Density

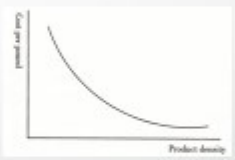


Figure 4 Relationship between Cost and Density

& Stowability, Handling, Liability

Market-related Factors

In addition to product characteristics, important market related factors also affect transportation costs. The most significant factors are:

1. Degree of intra-mode and inter-mode competition;
2. Location of markets;
3. Nature and extent of government regulation of transportation carriers;
4. Balance or imbalance of freight traffic in a territory;
5. Seasonality of product movements (such as the movement of fruits and vegetables to coincide with growing seasons);
6. Whether the product is being transported domestically or internationally.

Comparative of Different Transportation Modes

	Motor	Rail	Air	Water	Pipeline
Cost	Moderate	Low	High	Low	Low
Market coverage	Point to point	Terminal to terminal	T of T	T to T	T to T
Degree of competition	Many	Moderate	Moderate	Few	Few
Predominate traffic	All types	Low-moderate value High density	High value Low density	Cost	Cost
Average distance (miles)	500	600	900	400-1.400	300
Capacity (tons)	10-25	50-12.000	5-125	1.000-60.000	30.000-2.500.000
Speed	Moderate	Slow	Fast	Slow	Fast
Availability	High	Moderate	Moderate	Low	Low
Consistency	High	Moderate	High	Low-moderate	High
Loss and damage	Low	Moderate-high	Low	Low-moderate	Low
Flexibility	High	Moderate	Low/moderate	Low	Low

Terminal services

Other transportation arrangements

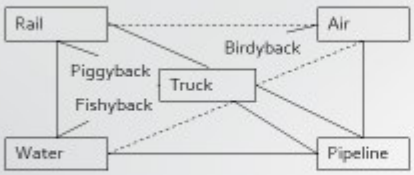


Figure 5 Intermodal Transportation Service

Figure 7 Small-package Carriers

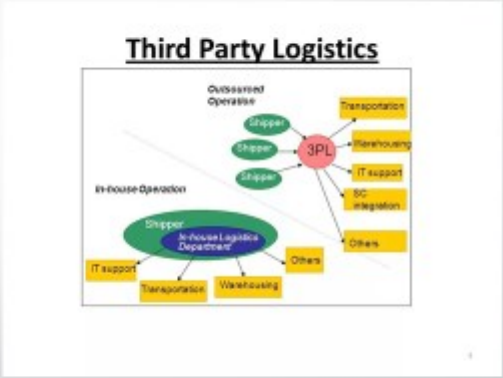


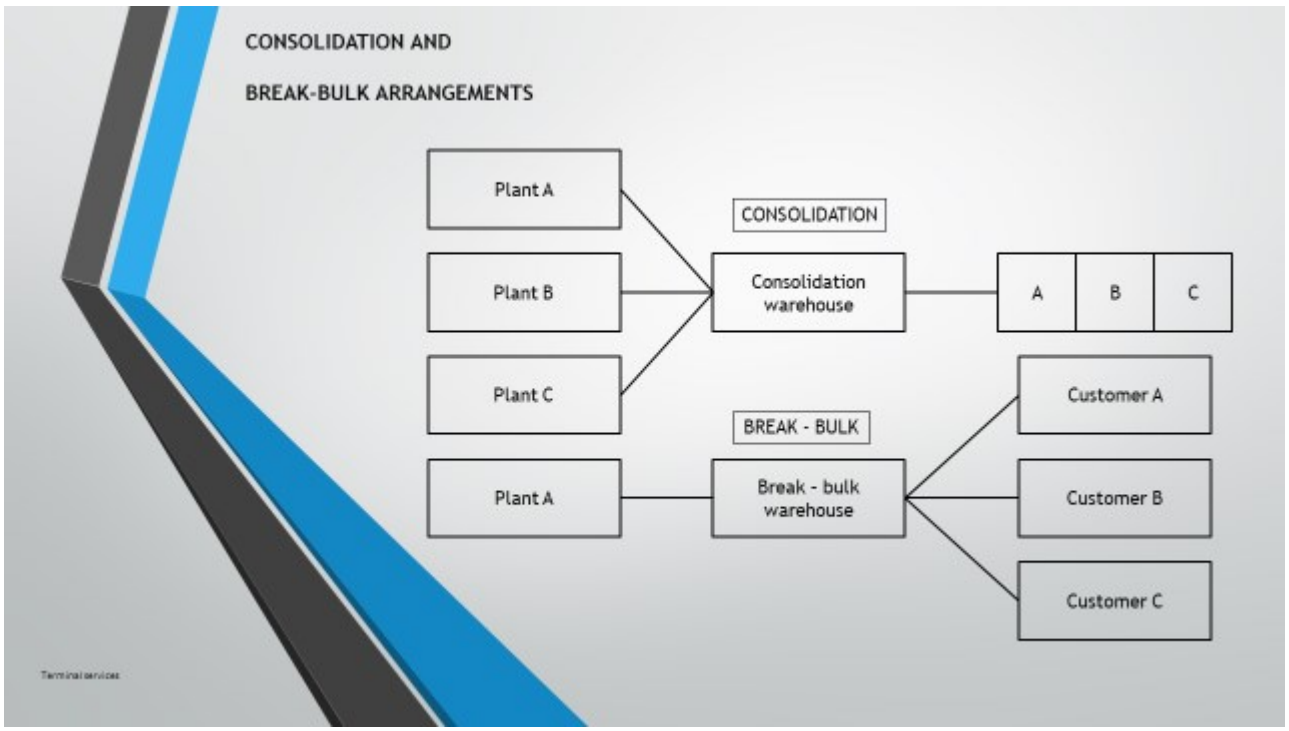
Figure 6 Non-operating Third Parties

Terminal services

Theme 5: 3.Logistical integration objectives

The economic benefits of consolidation and break-bulk are to reduce transportation cost by using warehouse capability to increase shipment economies of scale.

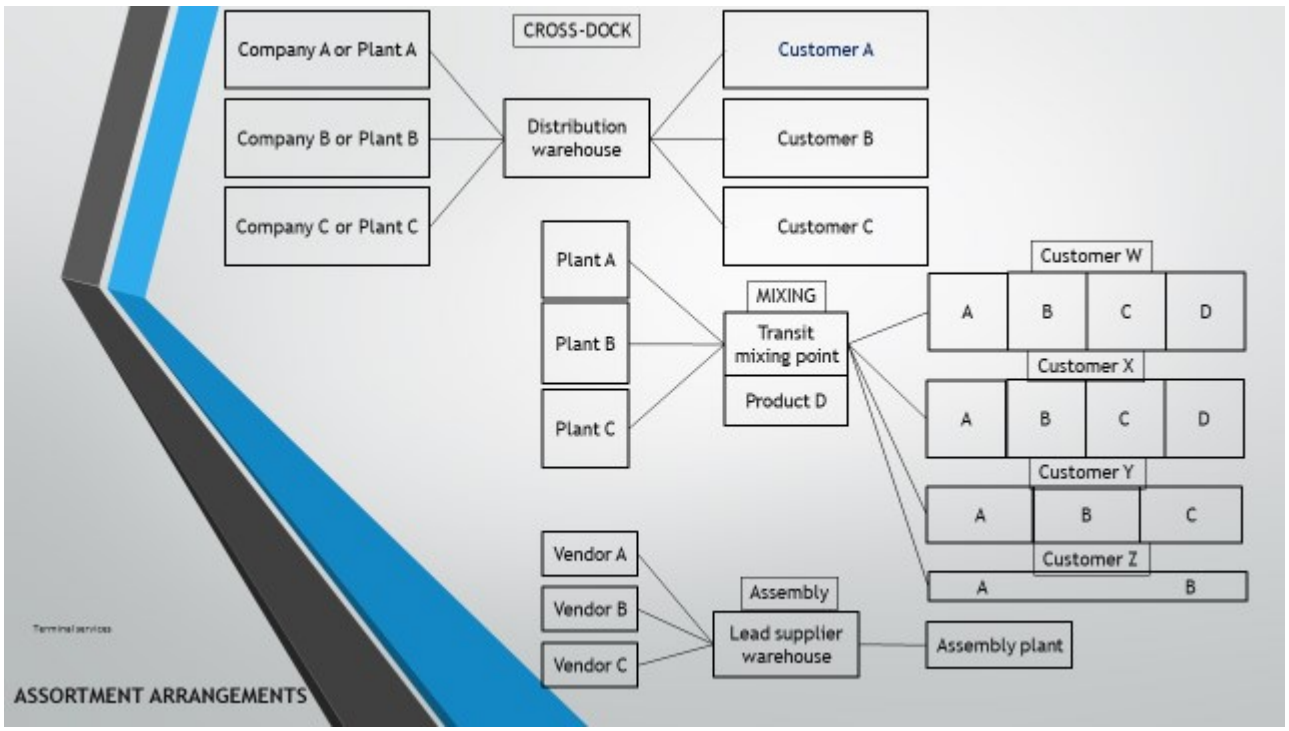
In consolidation, the warehouse receives materials from a number of sources, which are combined into a large single shipment to a specific destination, such as a customer. The benefits are the realization of the lowest possible freight rate, timely and controlled delivery, and reduced congestion at a customer's receiving dock. The warehouse enables both the inbound movement from origin and the outbound movement to destination to consolidate into a larger shipment, which generally incurs lower transportation charges and often quicker delivery.



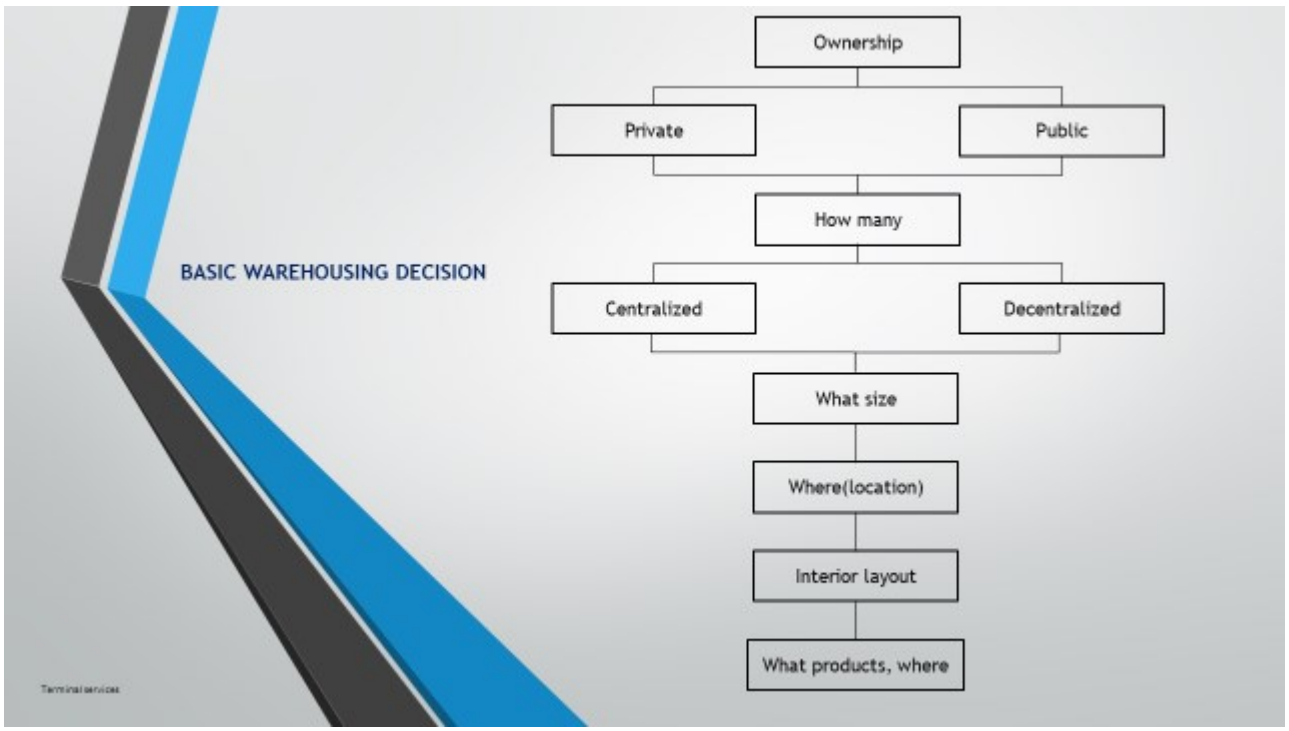
The basic benefit of assortment is to reconfigure freight as it flows from origin to destination. Three types of assortments — cross-docking, mixing, and assembly — are widely used in logistical systems.

The objective of cross-docking is to combine inventory from multiple origins into an assortment for a specific customer. Retailers make extensive use of cross-dock operations to replenish fast-moving store inventories.

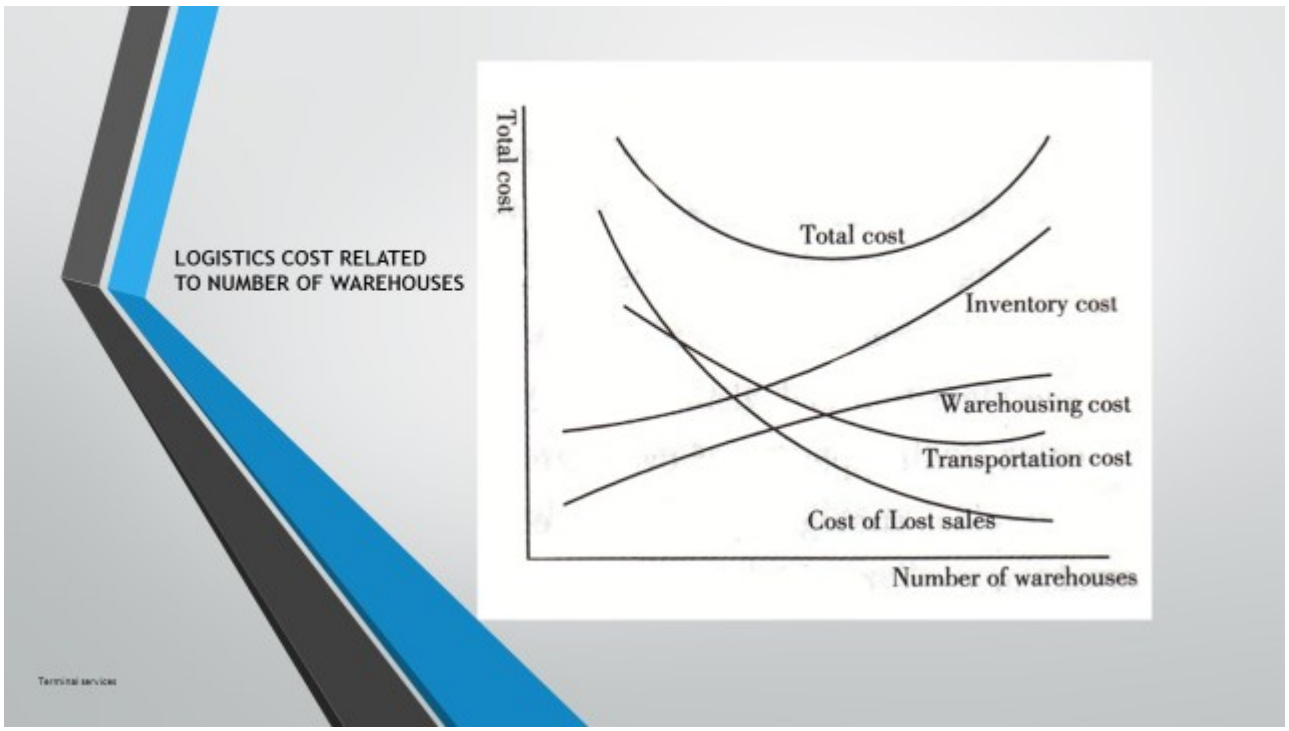
Precise on-time performance from each manufacturer is required. As product is received and unloaded at the facility, it is sorted by store destination. In most instances, the retailer has communicated precise volume requirements of each product for each store. The manufacturers, in turn may have sorted, loaded, and labeled the appropriate quantity for each store. Product is then literally moved across the dock from the delivery into a truck destined for the appropriate store location. Once trucks are loaded with mixed product from multiple manufacturers, they are released from transport to the retail destination.



One of the more important decisions a logistics executive faces is how to develop an optimal warehousing network for the firm's products and customers. Such a decision encompasses a number of significant elements. Management must determine the size and number of warehouses, and must also ascertain their location. Finally, each warehouse must be laid out and designed properly in order to maximize efficiency and productivity. Figure 6-3 shows how the basic warehousing decision being made.



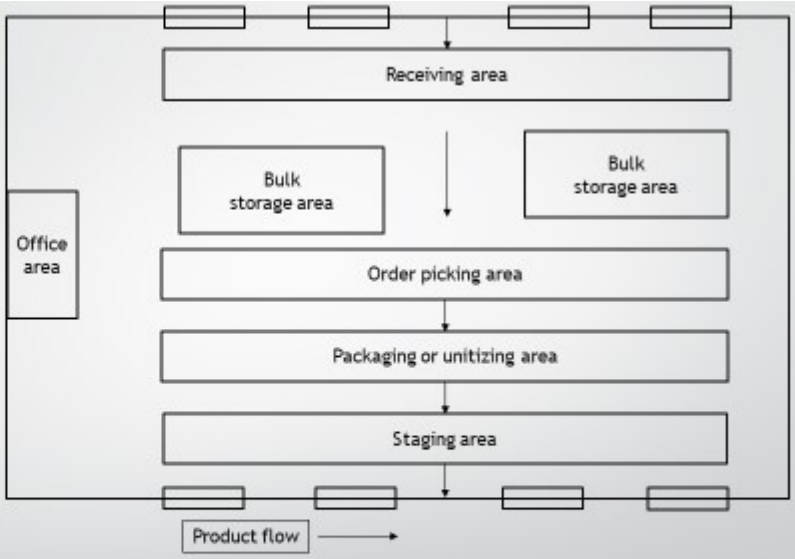
One of the logistics manager's most important tasks is to decide how many warehouses to have in the system. As was the case when examining private versus public warehousing, evaluation the general cost trade-offs in such decisions would probably be best. Figure 6-4 depicts how increasing the number of warehouses in a logistics system affects important physical distribution costs. As the number of warehouses increases, transportation cost and the cost of lost sales decline, whereas inventory cost and warehousing cost increase, total cost will generally decline. However, total costs begin to rise as increasing inventory and warehousing costs offset decreasing transportation costs and the cost of lost sales. Of course, the total cost curve and the range of warehouses it reflects will be different for each company.



A good warehouse layout can increase output, improve product flow, costs, improve service to customers, and provide better employee working conditions. The optimal warehouse layout and design for a firm will vary by the type of product being stored, the company's financial resources, the competitive environment, and the needs of customers. Irrespective of the preceding factors, however, it is imperative that the firm develop an optimal warehousing system for itself using a logical and consistent decision strategy.

Whatever layout the company finally selects for its warehouse, it is vital that all available space be utilized as fully and efficiently as possible. Good space utilization practices begin with a layout design to provide the optimum balance between space utilization and handling efficiency.

BASIC WAREHOUSE DESIGN



NOTES

1. With the arrival of just-in-time, strategic alliances, and logistics supply chain philosophies in the 1990s, the warehouse had taken on a strategic role of attaining the logistics goals of shorter cycle times, lower inventories, lower costs, and better customer service.

2. We can define warehousing as that part of a firm's logistics system that stores products (raw materials, parts, goods-in-process, finished goods) at and between point-of origin and point-of consumption, and provides information to management on the status, condition, and disposition of items being stored.

3. The use of warehousing enables management to select the transport modes and inventory levels that when combined with communication and order processing systems and production alternatives, minimize total cost while providing a desired level of customer service.

4. Strategic decisions deal with the allocation of logistics resources over an extended time in a manner that is consistent and supportive of overall enterprise policies and objectives.

3.PRACTICAL PART

Practical work No. 1. Choice of mode of transportation

A Belarusian company has an assembly plant in the South-East Asia region. A wide range of component parts is regularly shipped from Belarus to the assembly plant. The question often arises: how to transport the cargo - by air or by sea?

Table 1. The most important factors in choosing the mode of transportation

№	Factor Name	Units of measurement	Maritime transportation	Air transportation
1	Freight rate	$/m³	250	1154
2	Travel time	day	50	10
3	Interest rate on cargo stocks en route	% in year	7	7
4	Additional insurance stock at assembly plant	day	14	–
5	Additional inventory costs at the assembly plant	% in year	15	–

In the example under consideration, the freight rate for air transportation is higher than for sea transportation. However, products are not in transit as long by air as they are by sea.

Consequently, the interest costs for in-transit inventory and insurance inventory in the assembly plants warehouse are lower.

Determine: which mode of transportation the company will choose when the unit cost of goods is $ 5,000, 10,000, 50,000, or 50,000.

Solution.

Table 2. Choice of mode of transportation (example of calculation)

Maritime transportation	Air transportation
Unit cost of goods 5 000 $	
250 $/m³ + (5 000 * 0,07 / 365 * 50) + (5 000 * 0,15 / 365 * 14) = 250 + 48 + 29 = **327 $/m³**	1154 $/m³ + (5 000 * 0,07 / 365 * 10) = 1154 + 10 = 1164 $/m³
Unit cost of goods 10 000$	
250 + (10 000* 0,07/ 365 * 50) + (10 000* 0,15 / 365* 14) = 250 + 96 + 58 = **404 $/m³**	1154 + (10 000 * 0,07 / 365* 10) = 1154 + 19 = 1173 $/m³
Unit cost of goods 50 000 $	
250 + (50 000 * 0,07/365 * 50) + (50 000 * 0,15 / 365 * 14) = 250 + 479 + 288 = **1017$/m³**	1154 + (50 000*0,07/365 *10) = 1154 + 96 = 1250 $/m³

Question : at what cost of cargo would air transportation be preferable?

Table 3: Option for individual assignment

№	Maritime transportation		Air transportation		% rate for inventories in transit	Insurance stock at the assembly plant, days	Additional cost of inventories, %
	cargo	time in transit	cargo	time in transit			
0	250	50	1154	10	7	14	15
1	251	47	1152	9	8	13	16

4. KNOWLEDGE CONTROL SECTION

Issues for final control

1. What is distribution?

2. What types and attributes of products affect logistics solutions in distribution?

3. What factors determine the structure of logistics channels in distribution?

4. How can we classify the distribution system and structure of logistic channels in distribution?

5. What factors influence the choice of distribution channel and distribution system?

6. What are the main tasks of logistics management in distribution?

7. What does "customer service" mean in distribution?

8. What is the procedure for assessing the quality of logistics services in distribution?

9. How is the logistics of return flows in distribution organized?

10. What is the development of policy in the field of consumer service?

11. What are the advantages and disadvantages of different modes of transport?

12. What are the main methods of transportation?

13. Describe the main technological schemes of cargo delivery.

14. How should I choose the mode of transport in the implementation of transportation?

15. What role do freight forwarders and other logistics intermediaries play in transportation?

16. What are the criteria for selecting intermediaries?

17. What are the criteria for choosing a transport company?

18. What are the criteria for choosing a forwarding company?

19. What are the criteria for choosing a logistics operator?

20. What is the intermodal transport operator?

21. What is a multimodal transport operator?

22. What are the advantages of intermodal and multimodal transport technologies?

23. What is the complex of services of freight forwarding companies?

24. What tendency. development of freight forwarding services at the present stage?

25. What are the main provisions of the Russian legislation of freight forwarding services?

26. What are the main provisions of the international legislation of freight forwarding services?

27. What are the features of the freight forwarding company in connection with the method of transportation (mode of transport)?

28. What is the role of transport and freight forwarding companies in the development of integrated supply chain management?

29. What is a freight unit and how is it used in logistics?

30. What are the advantages of terminal transportation technology?

31. How does the intermodal / multimodal transport operator operate?

32. What are the basic principles of the intermodal / multimodal transport operator?

33. What is terminal transportation what is their role in ensuring cargo flows in ensuring cargo flows through transport corridors?

34. What is the practice of letters of credit in contracts of carriage?

35. How to calculate the cost of transportation by own transport?

36. What regulatory documents regulate the relationship between contractors in the transportation of goods?

37. How is the responsibility of the shipper in international transport determined?

5. SUPPORT SECTION

Discipline training programme

Учреждение образования
«Брестский государственный технический университет»

УТВЕРЖДАЮ
Проректор по учебной работе
_____ М.В. Нерода
«28» 06 2024
Регистрационный № УД-24-1-034/уч.

Транспорт и транспортные системы

Учебная программа учреждения высшего образования второй ступени по учебной дисциплине для специальности
7-06-0412-03 Логистика

2024

Учебная программа составлена на основе образовательного стандарта углубленного высшего образования по специальности 7-06-0412-03 «Логистика», примерного учебного плана по специальности 7-06-0412-03 Логистика от 02.12.2022 № 7-06-04-004/пр., учебной программы II ступени высшего образования «Транспорт и транспортные системы» рег. № УД 3920-19/уч., утв. 28.06.2019 г.

СОСТАВИТЕЛЬ:

Станкевич Д.В., старший преподаватель кафедры экономической теории и логистики

РЕКОМЕНДОВАНА К УТВЕРЖДЕНИЮ:

Кафедрой экономической теории и логистики
Заведующий кафедрой Г.Б. Медведева
(протокол № 11 от 10.06.2024);

Методической комиссией экономического факультета
Председатель методической комиссии Л.А. Захарченко
(протокол № 5 от 26.06 2024);

Научно-методическим советом БрГТУ (протокол № 5 от 28.06. 2024);

EXPLANATORY NOTE

The curriculum of the academic discipline “Transport and transport systems” is developed for master's students of the specialty 1-26-80-06 “Logistics” of full-time education. The structure of the curriculum and the methodology of teaching the discipline takes into account the latest achievements in the field of pedagogy and information technology oriented graduate students to the acquisition of appropriate professional competencies.

The purpose of teaching the academic discipline.

“Transport and transportation systems” forms the skills of master students to use theoretical knowledge and practical skills in the field of transport logistics system for the subsequent application of their knowledge in their professional activities.

The main objectives of the study of the academic discipline “Transport and transport systems” - the formation of students' knowledge about the rapidly developing in the world new scientific direction - transport logistics, the science of organization and management of processes and material flows in the transport system.

Teaching of the discipline is based on the analysis, development factors and the concept of transport system. The importance of the transport system in the processes of integration and internationalization, as well as the main components of the international transport system in their interrelation are considered in detail: the infrastructure of the global transport system, the content of transport logistics systems, management of transport logistics processes, information support of transport systems and others.

In the course of the study master's degree students should have competences corresponding to the following requirements: SC-2. To be able to plan transport operations taking into account the optimization of logistic processes of transport systems.

As a result of studying the academic discipline master students should know:

 theoretical and methodological foundations of transportation logistics processes;

 techniques and methods of risk assessment, elements of uncertainty in the implementation of transport operations and optimization of processes of their implementation;

 forms and methods of organization of transport activity taking into account the logistic system;

 basics of transport processes management at the organization of transport activity;

be able to:

 plan transport operations taking into account optimization of logistic processes of transport systems;

 calculate alternative variants of material flows promotion to the external market, select the optimal one;

 develop the system of document circulation taking into account the achievements of information technologies;

 optimize the system of logistic service when promoting goods on the international market;

have skills:

 general organization of material flows and optimization of logistic processes of transport activity;

 evaluation of alternative variants of transport systems in order to optimize logistics processes;

 planning of logistic processes of transportation activity of the enterprise;

 supply chain management in the transportation logistics system;

 examples of modular systems in transport logistics, optimization of transport flows in global logistics.

Plan of academic discipline for full-time and part-time form of obtaining advanced higher education

Specialty code (areas of specialty)	Name of the specialty (areas of specialty)	Course	Semester	Total Study Hours	Number of credits	Classroom hours (in accordance with the HEI curriculum)					Academic hours for a course project (work)	Current Attestation Form
						Altogether	Lecture	Labs	Practical exercises	Seminars		
7-06-0412-03	Logistics (full-time)	1	1	100	3	44	22	22	-	-	-	exam
7-06-0412-03	Logistics (part-time)	1	1	100	3	12	6	-	6	-	-	exam

1. CONTENT OF EDUCATIONAL MATERIAL LECTURES AND THEIR CONTENT

1.1.1. Transport system and management of transport systems Transport structure. Road transport system and its features. Analysis of transport systems. Features of the transport management system. Formulation of a transport problem and construction of its mathematical model.

1.1.2 Organizational and production structures of transport Structure of the transport process. Basic principles of transportation organization. Organization of road transportation. Production structure of a motor transport enterprise.

1.1.3. Economic and organizational essence of transport systems and assessment of their competitiveness Types of organizational structures. Structure of the mechanistic type. Structure of the organic type. Corporate structure. Individualistic structure. Linear

structure. Line-staff structure. Functional structure. Divisional structure. Project structure. Matrix structure.

1.1.4. Information and logistics systems and transportation technologies Stages of the management decision-making process. Stages of management decision. Principles of construction and basic provisions of organizational management structures. Requirements for organizational management structures. Development of organizational and structural forms of management.

1.1.5. Transport service of the passenger transportation system Management of the process of passenger transportation. Structure of the rolling stock of urban passenger transport. GPT bus stops. System for planning and monitoring the work of the ATG.

Quality indicators of transportation Consumer relationship management. Quality management system. Quality management mechanism. Informativeness in the quality system of cargo delivery.

1.2. PRACTICAL (seminar) classes THEIR CONTENT (CORRESPONDENCE FORM)

1.2.1 Formulation of a transport problem and the construction of its mathematical model.

1.2.2 Transport problems with additional constraints

1.2.3 Solving a transport problem using Excel.

1.3. LIST OF TOPICS OF LABORATORY CLASSES, THEIR NAME (FULL-TIME FORM)

1.3.1. Formulation of a transport problem and construction of its mathematical model. The Northwest Angle Method for Solving the Transport Problem

1.3.2. Determination of the optimal time for replacing the vehicle

1.3.3. Transport tasks with additional restrictions

1.3.4. Optimization of the support solution. Cycle estimation method. Method of potentials.

1.3.5. Bandwidth-constrained task. Tasks leading to transport. The task of reconstruction. Assignment problem.

1.3.6. Solving a transport problem using Excel. Compilation of circular routes. The traveling salesman's task.

2. REQUIREMENTS FOR THE COURSE PROJECT (WORK)

Term paper in this discipline is not provided.

3.1. EDUCATIONAL AND METHODICAL MAP OF THE ACADEMIC DISCIPLINE for the full-time form of obtaining in-depth higher education

Section number, topics	Title of the section, topics	Number of classroom hours				Number of hours of self-service work	Form of knowledge control
		Lecture	Labs	Practical exercises	Seminars		
1.	Transport system and management of transport systems	2	4			6	Laboratory work, preparation of multimedia presentations and reports
2.	Organizational and production structures of transport	4	4			10	Laboratory work, preparation of multimedia presentations and reports
3.	Economic and organizational essence of transport systems and assessment of their competitiveness	4	4			10	Laboratory work, preparation of multimedia presentations and reports
4.	Information and Logistics Systems and Transportation Technologies	4	4			10	Laboratory work, preparation of multimedia presentations and reports
5.	Transport services for the passenger transportation system	4	4			10	Laboratory work, preparation of multimedia presentations and reports
6.	Indicators of the quality of transport	4	2			10	Laboratory work, preparation of multimedia presentations and reports
	Altogether	22	22			56	Exam

3.2. EDUCATIONAL AND METHODICAL MAP OF THE ACADEMIC DISCIPLINE for extramural form of obtaining in-depth higher education

Section number, topics	Title of the section, topics	Number of classroom hours				Number of hours of self-service work	Form of knowledge control
		Lecture	Labs	Practical exercises	Seminars		
1	Transport system and management of transport systems	1		2		14	Laboratory work, preparation of multimedia presentations and reports
2	Organizational and production structures of transport	1				16	Laboratory work, preparation of multimedia presentations and reports
3	Economic and organizational essence of transport systems and assessment of their competitiveness	1				16	Laboratory work, preparation of multimedia presentations and reports
4	Information and Logistics Systems and Transportation Technologies	1		2		14	Laboratory work, preparation of multimedia presentations and reports
5	Transport services for the passenger transportation system	1		2		14	Laboratory work, preparation of multimedia presentations and reports
6	Indicators of the quality of transport	1				14	Laboratory work, preparation of multimedia presentations and reports
	Altogether	6		6		88	Exam

4. INFORMATION AND METHODOLOGICAL PART

4.1 Legislative and regulatory acts

1. О железнодорожном транспорте. Закон Республики Беларусь.6 января 1999 г. №237-З:в ред. Закон Респ. Беларусь от 22 декабря 2011 г., № 326-З //Эталон Беларусь [Электронный ресурс] / Нац. Центр правовой информ. Респ. Беларусь, Минск, 2012.- Режим доступа: http://etalonline.by.

2. О транспортно-экспедиционной деятельности: Закон Респ. Беларусь 13 июня 2006 г. № 124-З : в ред. Закона Респ. Беларусь от29ноября 2010 г., № 195-З//Эталон - Беларусь[Электронный ресурс],- /Нац. центр правовой информ. Республики Беларусь Минск, 2012.- Режим доступа: http://etalonline.by.

3. Об автомобильном транспорте и автомобильных перевозках: Закон Респ.Беларусь 14 августа 2007 г. № 278-З: в ред . Закона Респ. Беларусь от 4 января 201 О г. № 109-З//Эталон -Беларусь[Электронный ресурс], /Национальный центр правовой информ. Республики Беларусь Минск, 2012. .- Режим доступа: http://etalonline.by.

4. Об основах транспортной деятельности: Закон Республики Беларусь от 5.05.1998 г., № 140-З в ред. Закона Респ. Беларусь от 9 ноября 2009 г., № 52-З */1* Эталон Беларусь [Электронный ресурс] / Нац. Центр правовой информ. Респ. Беларусь, Минск, 2014.- Режим доступа: http://etalonline.by.

4.2 Reference citations:

1. Транспортная логистика. Учебное пособие. Под общ. ред. Л.С. Федорова М., Кнорус, 2016, 310 с.

2. Управление цепями поставок в транспортном комплексе. Учебное пособие. Под ред. Л .Б.Миротина.М., Телеком, 2016, 262 с.

3. Логистика [Текст] : учеб.-метод. пособие / О. М. Овечкина. –Мн. : Амалфея, 2020. – 215 с.

4. Логистика [Текст] : учеб. пособие / П. А. Дроздов. - Мн. : Выш. шк., 2019. - 430 с. - Библиогр.: с. 423–424.

5. Милославская, С.В.Транспортные системы и технология перевозок./ С.В.Милославская М.,Инфра, 2017, 116 с.

4.3.Further reading:

6. Миротин, Л.Б. Транспортно-складские комплексы. / Л.Б.Миротин М., Академия, 2015, 224 с.

7. Слоун, Р.Е. Новые идеи в управлении цепями поставок./Р.Е. Слоун М., Акселот, 2015, 230 с.

8. Герами, В.Д., Колик А.В. Управление транспортными системами и транспортное обеспечение в логистике. /В.Д.Герами М., Юрайт, 2015, 510 с.

9. Городко, М.В. Развитие логистических систем: анализ, проблемы, решения. /М.В.Городко Минск, Право и экономика, 2014, 368 с.

10. Экономика транспорта. Учебное пособие. Под ред. Е.В. Будриной М., Юрайт, 2016, 366 с"

11. Мониторинг рынка транспортных услуг. Учебное пособие. Под ред. Михальченко А.А. Гомель, БелГУТ, 2017, 271 с.
12. Безопасность дорожного движения: парадигмы развития. Пособие для подготовки магистрантов. Под ред. Капского Д.В. Минск, Капитал Принт, 2017, 264 с.
13. Безопасность дорожного движения: транспортно-трасологическая экспертиза дорожно-транспортных происшествий. Пособие для подготовки магистров. Под ред. Капского Д.В. Минск, Капитал Принт, 2017, 140 с.

4.2. A list of computer programs, visual and other aids, guidelines and materials, technical training aids, equipment for laboratory work. Microsoft Office Excel is a spreadsheet processor with built-in analysis and forecasting capabilities

4.3. List of means for diagnosing the results of educational activity To diagnose the results of educational activity, the following are used:

1. Oral questioning.
2. Solving tasks.
3. Testing in the distance learning system of BSTU moodle.bstu.by
3. Written Exam

4.4. Methodical recommendations for the organization and implementation of independent work of students in the academic discipline Independent work provides for the study of issues submitted for independent study, taking notes of educational literature; study of additional literature and Internet sources; preparation of reports and presentations. When performing independent work, students are recommended to use basic and additional literature, as well as the periodical journal "Logistics and Supply Chain Management" (http://www.logistika–prim.ru). List of questions submitted for independent study on the topics of the discipline

TOPIC 1. Transport system and management of transport systems The essence of a single transport system World trends in the field of transport services. Features of the development and functioning of transport services in the Republic of Belarus. Formation of integrated logistics systems for the delivery of goods References:4, 7, 8.

TOPIC 2. Organizational and production structures of transport Parameters for assessing the level of competitiveness of cargo delivery systems. Integral Indicators of Evaluation of Transport Services in Logistics Production and Transport and Sales Systems. Literature:3, 10.

TOPIC 3. Economic and organizational essence of transport systems and assessment of their competitiveness Experience in the implementation of logistics transportation systems. Economically, the mechanism of international commodity

distribution of logistics systems of transport and forwarding complexes. Logistics system for managing freight forwarding complexes. Literature:9.

TOPIC 4. Information and logistics systems and transportation technologies Functions of indifference of the main competitive logistics schemes for the delivery of goods. Tariff system for the delivery of goods of the Customs Union. Tariff system for the delivery of goods of the European Union. Literature:1, 6, 10.

TOPIC 5. Transport service of the passenger transportation system Comprehensive logistics outsourcing in the field of cargo and passenger transportation services. Integrated logistics service. Literature:2, 6.

Topic 6. Indicators of the quality of transport Integration of the Republic of Belarus into the system of international security of cargo and passenger transportation. Information support in the field of transport security. Basic requirements for the organization of the road safety service at the company. Requirements for the qualification of road safety service employees. Literature:11, 12.

LIST OF QUESTIONS FOR THE EXAM

1. What is distribution?

2. What types and attributes of products affect logistics solutions in distribution?

3. What factors determine the structure of logistics channels in distribution?

4. How can we classify the distribution system and structure of logistic channels in distribution?

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36. What regulatory documents regulate the relationship between contractors in the transportation of goods?

37. How is the responsibility of the shipper in international transport determined?

ПОЯСНИТЕЛЬНАЯ ЗАПИСКА

Учебная программа по учебной дисциплине «Транспорт и транспортные системы» разработана для магистрантов специальности «Логистика». Структура учебной программы и методика преподавания дисциплины учитывает последние достижения в области педагогики и информационных технологий ориентирует магистрантов на приобретение соответствующих профессиональных компетенций.

Цель преподавания учебной дисциплины.

«Транспорт и транспортные системы» формирует у магистрантов навыки использования теоретических знаний и практических навыков в области транспортной логистической системы для последующего применения ими полученных знаний в своей профессиональной деятельности.

Основные задачи изучения учебной дисциплины «Транспорт и транспортные системы» - формирование у студентов знаний о бурно развивающемся в мире новом научном направлении – транспортной логистике, науке об организации и управлении процессами и материальными потоками в транспортной системе.

Преподавание учебной дисциплины строится на анализе, факторов развития и концепции транспортной системы. Подробно рассматриваются значение транспортной системы в процессах интеграции и интернационализации, а также основные составляющие международной транспортной системы в их взаимосвязи: инфраструктура глобальной транспортной системы, содержание транспортных логистических систем, управление транспортными логистическими процессами, информационное обеспечение транспортных систем и др.

В ходе освоения программы учебной дисциплины «Транспорт и транспортные системы» у магистрантов должны быть сформированы компетенции, соответствующие следующим требованиям: СК-2. Уметь планировать транспортные операции с учетом оптимизации логистических процессов транспортных систем.

В результате изучения учебной дисциплины магистранты должны знать:

– теоретические и методологические основы транспортных логистических процессов;

– приемы и методы оценки риска, элементов неопределенности при осуществлении транспортных операций и оптимизации процессов их осуществления;

– формы и методы организации транспортной деятельности с учетом логистической системы;

– основы управления транспортными процессами при организации транспортной деятельности;

уметь:

– планировать транспортные операции с учетом оптимизации логистических процессов транспортных систем;

– рассчитать альтернативные варианты продвижения материальных потоков на внешний рынок, выделить оптимальный;

– разработать систему документооборота с учетом достижений информационных технологий;

– оптимизировать систему логистического сервиса при продвижении товаров на международный рынок;

иметь навыки:

– общей организации материальных потоков и оптимизации логистических процессов транспортной деятельности;

– оценки альтернативных вариантов транспортных систем с целью оптимизации логистических процессов;

– планирования логистических процессов транспортной деятельности предприятия;

– управления цепями поставок в системе транспортной логистики;

– применения модульных систем в транспортной логистике, оптимизации транспортных потоков в глобальной логистике.

План учебной дисциплины для дневной и заочной формы получения углубленного высшего образования

Код специальности (направления специальности)	Наименование специальности (направления специальности)	Курс	Семестр	Всего учебных часов	Количество зачетных единиц	Аудиторных часов (в соответствии с учебным планом УВО)					Академических часов на курсовой проект (работу)	Форма текущей аттестации
						Всего	Лекции	Лабораторные занятия	Практические занятия	Семинары		
7-06-0412-03	Логистика (дневное)	1	1	100	3	44	22	22	-	-	-	экзамен
7-06-0412-03	Логистика (заочное)	1	1	100	3	12	6	-	6	-	-	экзамен

1. СОДЕРЖАНИЕ УЧЕБНОГО МАТЕРИАЛА

1.1.ЛЕКЦИОННЫЕ ЗАНЯТИЯ И ИХ СОДЕРЖАНИЕ

1.1.1. Система транспорта и управление транспортными системами

Структура транспорта. Система автомобильного транспорта и ее особенности. Анализ транспортных систем. Особенности системы управления транспортом. Постановка транспортной задачи и построение ее математической модели.

1.1.2 Организационно-производственные структуры транспорта

Структура транспортного процесса. Основные принципы организации перевозок. Организация автомобильных перевозок. Производственная структура автотранспортного предприятия.

1.1.3. Экономико-организационная сущность транспортных систем и оценка их конкурентоспособности

Типы организационных структур. Структура механистического типа. Структура органического типа. Корпоративная структура. Индивидуалистская структура. Линейная структура. Линейно-штабная структура. Функциональная структура. Дивизиональная структура. Проектная структура. Матричная структура.

1.1.4. Информационно-логистические системы и технологии перевозок

Этапы процесса принятия управленческих решений. Стадии управленческого решения. Принципы построения и основные положения организационных структур управления. Требования к организационным структурам управления. Развитие организационно-структурных форм управления.

1.3.5. Транспортное обслуживание системы пассажирских перевозок

Управление процессом пассажирских перевозок. Структура подвижного состава городского пассажирского транспорта (ГПТ). Остановочные комплексы ГПТ. Система планирования и контроля за работой ГПТ.

1.3.6. Показатели качества транспортных перевозок

Управление взаимоотношениями с потребителями. Система управления качеством. Механизм управления качеством. Информативность в системе качества доставки грузов.

1.2. ПРАКТИЧЕСКИЕ (СЕМИНАРСКИЕ), ЗАНЯТИЯ ИХ СОДЕРЖАНИЕ (ЗАОЧНАЯ ФОРМА)

1.2.1 Постановка транспортной задачи и построение ее математической модели.

1.2.2 Транспортные задачи с дополнительными ограничениями

1.2.3 Решение транспортной задачи с использованием Excel.

1.3. ПЕРЕЧЕНЬ ТЕМ ЛАБОРАТОРНЫХ ЗАНЯТИЙ, ИХ НАЗВАНИЕ (ДНЕВНАЯ ФОРМА)

1.3.1. Постановка транспортной задачи и построение ее математической модели. Метод северо-западного угла для решения транспортной задачи

1.3.2. Определение оптимального срока замены транспортного средства

1.3.3. Транспортные задачи с дополнительными ограничениями

1.3.4. Оптимизация опорного решения. Метод оценки циклов. Метод потенциалов.

1.3.5. Задача с ограниченной пропускной способностью. Задачи, приводимые к транспортной. Задача о реконструкции. Задача о назначениях.

1.3.6. Решение транспортной задачи с использованием Excel. Составление кольцевых маршрутов. Задача коммивояжера.

2.ТРЕБОВАНИЯ К КУРСОВОМУ ПРОЕКТУ (РАБОТЕ)

Курсовая работа по данной дисциплине не предусмотрена.

3.1. УЧЕБНО-МЕТОДИЧЕСКАЯ КАРТА УЧЕБНОЙ ДИСЦИПЛИНЫ
для дневной формы получения углубленного высшего образования

Номер раздела, темы	Название раздела, темы	Количество аудиторных часов				Количество часов самост. работы	Форма контроля знаний
		Лекции	Лабораторные занятия	Практические занятия	Семинарские занятия		
7.	Система транспорта и управление транспортными системами	2	4			6	Лабораторная работа, подготовка мультимедийных презентаций и докладов
8.	Организационно-производственные структуры транспорта	4	4			10	Лабораторная работа, подготовка мультимедийных презентаций и докладов
9.	Экономико-организационная сущность транспортных систем и оценка их конкурентоспособности	4	4			10	Лабораторная работа, подготовка мультимедийных презентаций и докладов
10.	Информационно-логистические системы и технологии перевозок	4	4			10	Тест, подготовка мультимедийных презентаций и докладов
11.	Транспортное обслуживание системы пассажирских перевозок	4	4			10	Тест, подготовка мультимедийных презентаций и докладов
12.	Показатели качества транспортных перевозок	4	2			10	Лабораторная работа, подготовка мультимедийных презентаций и докладов
	Всего	22	22			56	Экзамен

3.2. УЧЕБНО-МЕТОДИЧЕСКАЯ КАРТА УЧЕБНОЙ ДИСЦИПЛИНЫ
для заочной формы получения углубленного высшего образования

Номер раздела, темы	Название раздела, темы	Количество аудиторных часов				Количество часов самост. работы	Форма контроля знаний
		Лекции	Лабораторные занятия	Практические занятия	Семинарские занятия		
1	Система транспорта и управление транспортными системами	1		2		14	Устный опрос, подготовка мультимедийных презентаций и докладов
2	Организационно-производственные структуры транспорта	1				16	Решение заданий, устный опрос
3	Экономико-организационная сущность транспортных систем и оценка их конкурентоспособности	1				16	Решение заданий, устный опрос
4	Информационно-логистические системы и технологии перевозок	1		2		14	Устный опрос, подготовка мультимедийных презентаций и докладов
5	Транспортное обслуживание системы пассажирских перевозок	1		2		14	Устный опрос, подготовка мультимедийных презентаций и докладов
6	Показатели качества транспортных перевозок	1				14	Решение заданий, устный опрос
	Всего	6		6		88	Экзамен

4. ИНФОРМАЦИОННО-МЕТОДИЧЕСКАЯ ЧАСТЬ

4.1 Законодательные и нормативные акты

1. О железнодорожном транспорте. Закон Республики Беларусь.6 января 1999 г. №237-З:в ред. Закон Респ. Беларусь от 22 декабря 2011 г., № 326-З //Эталон Беларусь [Электронный ресурс] / Нац. Центр правовой информ. Респ. Беларусь, Минск, 2012.- Режим доступа: http://etalonline.by.

2. О транспортно-экспедиционной деятельности: Закон Респ. Беларусь 13 июня 2006 г. № 124-З : в ред. Закона Респ. Беларусь от29ноября 2010 г., № 195-З//Эталон - Беларусь[Электронный ресурс],- /Нац. центр правовой информ. Республики Беларусь Минск, 2012.- Режим доступа: http://etalonline.by.

3. Об автомобильном транспорте и автомобильных перевозках: Закон Респ.Беларусь 14 августа 2007 г. № 278-З: в ред . Закона Респ. Беларусь от 4 января 201 О г. № 109-З//Эталон -Беларусь[Электронный ресурс], /Национальный центр правовой информ. Республики Беларусь Минск, 2012. .- Режим доступа: http://etalonline.by.

4. Об основах транспортной деятельности: Закон Республики Беларусь от 5.05.1998 г., № 140-З в ред. Закона Респ. Беларусь от 9 ноября 2009 г., № 52-З */1* Эталон Беларусь [Электронный ресурс] / Нац. Центр правовой информ. Респ. Беларусь, Минск, 2014.- Режим доступа: http://etalonline.by.

Основная литература:

1. Транспортная логистика. Учебное пособие. Под общ. ред. Л.С. Федорова М., Кнорус, 2016, 310 с.

2. Управление цепями поставок в транспортном комплексе. Учебное пособие. Под ред. Л .Б.Миротина.М., Телеком, 2016, 262 с.

3. Логистика [Текст] : учеб.-метод. пособие / О. М. Овечкина. –Мн. : Амалфея, 2020. – 215 с.

4. Логистика [Текст] : учеб. пособие / П. А. Дроздов. - Мн. : Выш. шк., 2019. - 430 с. - Библиогр.: с. 423–424.

5. Милославская, С.В.Транспортные системы и технология перевозок./ С.В.Милославская М.,Инфра, 2017, 116 с.

Дополнительная литература:

6. Миротин, Л.Б. Транспортно-складские комплексы. / Л.Б.Миротин М., Академия, 2015, 224 с.

7. Слоун, Р.Е. Новые идеи в управлении цепями поставок./Р.Е. Слоун М., Акселот, 2015, 230 с.

8. Герами, В.Д., Колик А.В. Управление транспортными системами и транспортное обеспечение в логистике. /В.Д.Герами М., Юрайт, 2015, 510 с.

9. Городко, М.В. Развитие логистических систем: анализ, проблемы, решения. /М.В.Городко Минск, Право и экономика, 2014, 368 с.

10. Экономика транспорта. Учебное пособие. Под ред. Е.В. Будриной М., Юрайт, 2016, 366 с"

11. Мониторинг рынка транспортных услуг. Учебное пособие. Под ред. Михальченко А.А. Гомель, БелГУТ, 2017, 271 с.

12. Безопасность дорожного движения: парадигмы развития. Пособие для подготовки магистрантов. Под ред. Капского Д.В. Минск, Капитал Принт, 2017, 264 с.

13. Безопасность дорожного движения: транспортно-трасологическая экспертиза дорожно-транспортных происшествий. Пособие для подготовки магистров. Под ред. Капского Д.В. Минск, Капитал Принт, 2017, 140 с.

4.2. Перечень компьютерных программ, наглядных и других пособий, методических указаний и материалов, технических средств обучения, оборудования для выполнения лабораторных работ.

Microsoft Office Excel – табличный процессор со встроенными возможностями анализа и прогнозирования

4.3. Перечень средств диагностики результатов учебной деятельности

Для диагностики результатов учебной деятельности используются:

1. Устный опрос.

2. Решение заданий.

3. Тестирование в системе дистанционного обучения УО БрГТУ moodle.bstu.by

3. Письменный экзамен

4.4.Методические рекомендации по организации и выполнению самостоятельной работы обучающихся по учебной дисциплине

Самостоятельная работа предусматривает изучение вопросов, вынесенных на самостоятельное изучение, конспектирование учебной литературы; изучение дополнительной литературы и интернет–источников; подготовку докладов и презентаций.

При выполнении самостоятельной работы обучающимся рекомендуется использовать основную и дополнительную литературу, а также периодический журнал «Логистика и управление цепями поставок» (http://www.logistika–prim.ru).

Перечень вопросов, вынесенных на самостоятельное изучение по темам дисциплины

ТЕМА 1. Система транспорта и управление транспортными системами

Сущность единой транспортной системы Мировые тенденции в сфере транспортных услуг. Особенности развития и функционирования транспортных услуг Республики Беларусь. Формирование интегрированных логистических систем доставки грузов

Литература: 4, 7, 8.

ТЕМА 2. Организационно-производственные структуры транспорта

Параметры оценки уровня конкурентоспособности систем доставки грузов. Интегральные показатели оценки услуг транспорта в логистической производственно-транспортной и транспортно-сбытовой системах.

Литература: 3, 10.

ТЕМА 3. Экономико-организационная сущность транспортных систем и оценка их конкурентоспособности

Опыт внедрения логистических систем транспортировки. Экономически механизм международного товародвижения логистических систем транспортно-экспедиционных комплексов. Логистическая система управления транспортно-экспедиционными комплексами.

Литература: 9.

ТЕМА 4. Информационно-логистические системы и технологии перевозок

Функции безразличия основных конкурентоспособных логистических схем доставки грузов. Тарифная система доставки грузов Таможенного Союза. Тарифная система доставки грузов Европейского Союза.

Литература: 1, 6, 10.

ТЕМА 5. Транспортное обслуживание системы пассажирских перевозок

Комплексный логистический аутсорсинг в области сервиса транспортных перевозок грузов и пассажиров. Интегрированный логистический сервис.

Литература: 2, 6.

ТЕМА 6. Показатели качества транспортных перевозок

Интеграция Республики Беларусь в систему международной безопасности перевозки грузов и пассажиров. Информационное обеспечение в области транспортной безопасности. Основные требования при организации службы безопасности дорожного движения на фирме. Требования к квалификации работников службы безопасности дорожного движения.

Литература: 11, 12.

ПЕРЕЧЕНЬ ВОПРОСОВ К ЭКЗАМЕНУ

1. Дайте определение понятию «транспорт».
2. Перечислите особенности транспорта и транспортной системы.
3. Дайте определение понятию «транспорт». Объясните, в чём состоит его экономическое, социальное, оборонное, политическое, научное значение.
4. Опишите сущность единой транспортной системы. Назовите её основную задачу.
5. Опишите сущность единой транспортной системы. Объясните, в каких сферах взаимодействия видов транспорта проявляется её единство.
6. Опишите структуру мировой транспортной системы.
7. Приведите классификацию видов транспорта по порядку использования и по форме собственности.
8. Приведите классификацию видов транспорта по конструктивной специфике и физической природе движения.
9. Приведите классификацию видов транспорта по природной среде следования, по объекту перевозки и по типу потока.
10. Приведите классификацию видов транспорта по географической протяженности транспортных линий и по периоду использования в связи с природно-климатическими условиями.
11. Приведите классификацию видов транспорта по составу объектов перевозки и по охвату территорий государств.
12. Опишите показатели перевозочной и погрузочно-разгрузочной работы, характеризующие работу транспортной системы.
13. Опишите показатели материально-технической базы, характеризующие работу транспортной системы.
14. Система транспорта и управление транспортными системами
15. Организационно-производственные структуры транспорта
16. Экономико-организационная сущность транспортных систем
17. Оценка конкурентоспособности транспортных систем
18. Информационно-логистические системы и технологии перевозок
19. Транспортное обслуживание системы пассажирских перевозок
20. Показатели качества транспортных перевозок
21. Состояние транспортного рынка и требования к транспортному обслуживанию.
22. Ключевые показатели результативности и эффективности логистики.
23. Цели, стратегии и задачи тарифного регулирования доставки грузов.
24. Тарифная система доставки грузов Республики Беларусь.
25. Пассажирский транспорт как элемент городской инфраструктуры. Классификация и моделирование ситуации транспортного обслуживания пассажиров.
26. Основные положения логистического подхода в технологии пассажирских перевозок.
27. Факторы выбора вариантов перевозки пассажиров.
28. Особенности перевозки пассажиров.
29. Сегментирование рынка пассажирских перевозок.

30. Виды городского транспорта.
31. Требования потребителей и возможности фирмы в сервисе перевозок грузов и пассажиров.
32. Объекты транспортной инфраструктуры и их роль в системе безопасности транспортных перевозок грузов и пассажиров.
33. Угрозы транспортной безопасности, их классификация и виды.
34. Требования к перевозчикам по обеспечению безопасности перевозки грузов и пассажиров.
35. Дайте определение понятия «управление транспортной системой».
36. Назовите принципы управления транспортом в условиях рыночной экономики.
37. Приведите классификацию грузовых автотранспортных средств.
38. Дайте определение маршрута движения. Опишите основные элементы маршрута движения (приведите схему).
39. Опишите варианты маршрута (используйте схемы).
40. Перечислите и охарактеризуйте показатели работы в транспортном секторе.
41. Транспортная задача.
42. Организационная структура транспортных систем