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

ПОГОДЖЕНО
Проректор з навчально-методичної роботи

_____ Каріна НЕМАШКАЛО

СМАРТ ЛОГІСТИКА

робоча програма навчальної дисципліни (РПНД)

Галузь знань	**07 "Управління та адміністрування"**
Спеціальність	**073 "Менеджмент"**
Освітній рівень	**перший (бакалаврський)**
Освітня програма	**"Логістика"**

Статус дисципліни	**вибіркова**
Мова викладання, навчання та оцінювання	**англійська**

Розробник:
к.е.н., доцент

Тетяна КОЛОДІЗЄВА

Завідувач кафедри
менеджменту, логістики та
інновацій

Олена ЯСТРЕМСЬКА

Гарант програми

Тетяна КОЛОДІЗЄВА

Харків
2023

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

SMART LOGISTICS

Program of the course

Field of knowledge	**07 "Management and administration"**
Specialty	**073 "Management"**
Study cycle	**first (bachelor)**
Study programme	**"Logistics"**

Course status	**elective**
Language	**English**

Developer:
PhD (Economics),
Associate Professor

Tetiana KOLODIZIEVA

Head of
Management, Logistics and Innovation
Department

Olena IASTREMSKA

Heard of Study Programme

Tetiana KOLODIZIEVA

Kharkiv
2023

INTRODUCTION

In logistics, the smart approacn ıs, first of all, aimed at ensuring the optimization of flow management through the use of technological and information and communication tools in order to organize "accurate" supply chains.

"SMART LOGISTICS" as an educational discipline is aimed at familiarizing students with the terminological apparatus, principles and tasks of smart logistics, its role in the development and formation of digital markets and the digital economy as a system.

The purpose of teaching the educational discipline is to form theoretical knowledge and practical skills in future specialists regarding the implementation of logistics SMART technologies, SMART systems, management of logistics SMART objects.

The objectives of the academic discipline are:

study of the concept of SMART LOGISTICS , its components, functions and tasks at different levels of the economy;

familiarization with the basics of state regulation, norms and standards of SMART LOGISTICS;

study and characterization of the main functional areas of SMART LOGISTICS;

researching the features of SMART LOGISTICS in terms of key logistics activities;

study of basic logistics SMART technologies ;

study of the basics of designing logistical SMART systems ;

SMART LOGISTICS infrastructure facilities .

The object of study of the discipline is the process of implementation of logistics SMART technologies, design of logistics SMART systems, management of logistics SMART objects.

The subject of the educational discipline is the theoretical and methodological and practical aspects of the intellectualization of logistics processes and systems.

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

Learning outcomes	Competences that must be mastered by a student of higher education
LO4	SC3
LO 5	SC4
LO 16	SC12
LO 19	SC17

LO 20	SC18

where, SC3. The ability to determine the prospects of the organization's development.

SC 4 . The ability to determine the functional areas of the organization and the connections between them.

SC12 The ability to analyze and structure the problems of the organization, to form reasonable solutions.

SC17. 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.

SC18. Ability to develop a logistics service system, logistics service strategy. Ability to organize logistics service for consumers and manage orders in the logistics service system. Ability to form a logistics service system and service quality system.

LO 4 . Demonstrate skills in identifying problems and justifying management decisions.

LO 5. Describe the content of the functional areas of the organization.

LO 16. Demonstrate the skills of independent work, flexible thinking, openness to new knowledge, be critical and self-critical.

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

LO 20. Organize efficient logistics service, determine policy and standards for the provision of logistics services, evaluate quality and optimize the level of customer service.

COURSE CONTENT

Content module 1. Theoretical principles of SMART LOGISTICS
Topic 1. Introduction to SMART LOGISTICS

Definition of SMART logistics, its components, functions, tasks and advantages. Objectives of smart logistics strategies along international freight corridors, for domestic distribution and urban logistics.

Topic 2. Patterns of formation of the theory and practice of SMART LOGISTICS

Formation of the concept of SMART LOGISTICS, its characteristic features and differences from traditional logistics. The evolution of logistics from "Logistics 1.0" to "Logistics 4.0". The development of the theory of SMART LOGISTICS, its distribution in the countries of the world, the main trends and prospects of practical application. State regulation of the development of SMART LOGISTICS. Non-state drivers of SMART logistics development. Standards and legal regulation of SMART LOGISTICS.

Topic 3. Functional areas of SMART LOGISTICS

SMART LOGISTICS in the areas of customer service, transportation, warehousing, production, procurement, distribution, information, financial and reverse logistics. Smart supply chains.

Topic 4. Tasks and functions of SMART LOGISTICS in terms of key

logistics activities

SMART approach in the structure of the logistics process. Tasks and functions of SMART LOGISTICS in transport and warehousing activities; in activities related to accommodation and provision of services; in wholesale and retail trade; repair of motor vehicles; in construction and industrial processing.

Content module 2. Practical aspects of SMART LOGISTICS
Topic 5. Logistics SMART technologies

The main technologies of SMART LOGISTICS: Internet of Things, unmanned vehicles, RFID, automobile and ride sharing , autonomous robots, virtual reality, bitcoin, blockchain, 3D printing, cloud computing, drones, Internet of vehicles, artificial intelligence, machine learning, deep learning, 5G technology, wireless network technology, etc.

Topic 6. Design of logistical SMART systems

Architecture of logistics SMART systems**.** Logistics business systems based on the Internet of Things. Structure, content, functions, design of smart logistics systems. Smart supply chain logistics systems. Effectiveness of smart logistics systems.

Topic 7. SMART LOGISTICS infrastructure

Information and financial infrastructure of SMART LOGISTICS. SMART LOGISTICS infrastructure objects: smart cities, smart shops and restaurants, smart parking, smart transport, smart water and energy supply, smart buildings, smart healthcare, smart libraries, smart recycling. Smart airports, ports and railway stations. SMART infrastructure of supply chains.

The list of laboratory classes/tasks by academic discipline is given in table. 2

Table 2

The list of laboratory studies

Name of the topic and / or task	Content
Topic 1. Task 1.	Development of components of SMART LOGISTICS at the macro , meso and micro levels of the economy.
Topic 2. Task 2.	Research on the development of SMART LOGISTICS in different countries of the world.
Topic 3. Task 3.	Analysis of practical solutions of SMART LOGISTICS .
Topic 4. Task 4.	Designing logistics processes based on the SMART approach .
Topic 5 . Task 5.	SWOT - analysis of implementation of key SMART LOGISTICS technologies .
Topic 6. Task 6.	Development of the logistics SMART system project .
Topic 7. Task 7.	SMART LOGISTICS infrastructure facilities .

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 - 7	Study of lecture material, legislative and regulatory acts
Topic 1 - 7	Preparation of laboratory works
Topic 1-7	Writing a research paper
Topic 1 - 7	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), problem lecture (Topic 7).

In person (demonstration (Topic 1-7)).

Laboratory work (Topic 1 - 7), experimental work (Topic 1 - 7).

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 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

(20 points), experimental work (10 points), laboratory works (20 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 "SMART logistics"

EXAM CARD No. 1

EXAMINATION TICKET No. 1

Task 1 (test). (14 points)
1. Define a technology that is not used in IoT :
a) global positioning system (GPS),
b) infrared sensors,
c) radio frequency identification devices (RFID),
d) laser scanners,
e) 3 D printing.

2. What is the disadvantage of a smart city?
a) increased air pollution,
b) more complex public services,
c) lack of privacy ,
d) higher level of unemployment.

3. Which city is the smartest in the world for 2022 according to the Smart Cities Index?
a) Singapore,
b) Zurich,
c) Copenhagen,
d) Sydney.

4. What are the challenges facing the implementation of smart cities?
a) limitation of available technologies,
b) high cost of implementation,
c) lack of state support.

5. By phase separation , technology 3 D printing does not change the logistics:
a) supply ,
b) production logistics ,
c) sales logistics ,
d) logistics of processing and disposal ;

e) there is no correct answer.

6. The main advantages of smart logistics should not include :
a) adaptation to changes in the external environment ; high technological mobility and the level of control of operating costs ;
b) compliance international quality standards ;
c) providing an opportunity rapid implementation of research projects ;
d) the need for specialists of a new formation and high competence .

7. Smart - approach uses principle :
a) specification (clarification) of the goal ,
b) metrics of component management processes ,
c) algorithmization of the phasing of achieving results ,
d) flexibility and the probability of completing tasks ,
c) regulations time ,
e) all answers are correct.

Task 2 (diagnostic). (10 points)
Calculate the effectiveness of the implementation of the "Smart Home" system based on the given data. The discount rate is 20%. Calculate net present income, profitability index, payback period and internal rate of return.
Table Output data.

Indicators	1 year	2 years	3 years	4 years	5 years	6 years	7 years old
Before installation system " Smart di m ".							
Utility payments	- 70,395	- 79,194	- 89,094	- 100,230	- 112,759	- 126,854	- 142,711
Unforeseen expenses	- 8000	- 8000	- 8000	- 8000	- 8000	- 8000	- 8000
Pecuniary flow	- 78,395	- 87,194	- 97,094	- 108,230	- 120,759	- 134,854	- 150,711 _
Cumulative cash flow	- 78,395	- 165,589	- 262,683	- 370,913	- 491,673	- 626,527	- 777,238

After _ installation systems Clever House

Installation cost	- 185,000						
Utility payments	- 42,237	- 47,517	- 53,456	- 60,138	- 67,656	- 76,112	- 85,627
Unforeseen expenses	- 5500	- 5500	- 5500	- 5500	- 5500	- 5500	- 5500
Cash flow	- 232,737	- 53,017	- 58,956	- 65,638	- 73,156	- 81,612	- 91,127
Savings or consumption	- 154,342	34,178	38,137	42,592	47,604	53,242	59,584
Cumulative cash flow	- 154,342	- 120,164	- 82,027	- 39,435	8169	61,411	120,995

Task 3 (heuristic). (16 points)
Conduct a SWOT analysis of the use of drones in last- mile logistics .

Protocol No. _____dated "___"_____20___was approved at the meeting of the Department of Management, Logistics and Innovation.

Examiner PhD of Economics , Assoc. Kolodizeva T.O.

Chief Department of Economics , Prof. Yastremska O.M.

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 net reduced income;
2 – the internal rate of return is calculated;
2 – the profitability index is calculated;
2 - the payback period is calculated.

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

4 – strengths of logistics technology are determined;
4 – identified the weaknesses of logistics technology;
4 – the possibilities of implementing logistics technology in last- mile logistics are determined ;
4 – the threats of the implementation of logistics technology in the logistics of the last mile are determined ;

RECOMMENDED LITERATURE

Main

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10. Academy for International Modern Studies (AIMS) 21 Wenlock Road , London N1 7GU United Kingdom . – [Electronic resource]. - Access mode: https://aims.education/smart-logistics-and-smart-logistics-solutions/