(Ф 03.02 – 110)

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
NATIONAL AVIATION UNIVERSITY
Faculty of Transport, Management and Logistics
Logistics Department

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Dean of the Faculty of Transport,
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«29» 11 2022

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«13» 12 2022

Quality Management System
COURSE TRAINING PROGRAM
on
"Business Analysis and Data Processing"

Educational Professional Programs: "Management of foreign economic activity", "Logistics", "Global logistics and supply chain management"

Field of study: 07 «Management and Administration»

Specialty: 073 «Management»

Mode of study	Seme-ster	Total (hours/ ECTS credits)	Lectures	Lab classes	Self-study	HW/ CGP/CW	Form of semester control
Full-time	1	105/3,5	17	17	71	-	Graded Test 1s.
Part-time	1	105/3,5	6	6	93	1CW – 1s.	Graded Test 1s.

Index: CM-7-073-2/21-2.1.1, CM-7-073-2/21-fs-2.1.1, CM-7-073-2pt/22-2.1.1, CM-7-073-2pt/22-fs-2.1.1, CM-7-073-3/21-2.1.2, CM-7-073-4/21-2.1.2

The Course Training Program on "Business Analysis and Data Processing" is developed on the basis of the Educational Professional Programs "Management of foreign economic activity", "Logistics", "Global logistics and supply chain management", Master Curriculums CM-7-073-2/21, CM-7-073-2/21-fs, CM-7-073-2pt/22, CM-7-073-2pt/22-fs, CM-7-073-3/21, CM-7-073-4/21 and Master Extended Curriculums ECM-7-073-2/22, ECM-7-073-2/22-fs, ECM-7-073-2pt/22, ECM-7-073-2pt/22-fs, ECM-7-073-3/22, ECM-7-073-4/22 for Specialty 073 "Management" and corresponding normative documents.

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Discussed and approved by the Graduate Department for Specialty 073 "Management", Educational Professional Programs "Logistics", "Global logistics and supply chain management" – Logistics Department, Minutes № 19 of 21.11.2022.

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INTRODUCTION

The Course Training Program on “Business Analysis and Data Processing” is developed based on the “Methodical guidance for the subject Course Training Program”, approved by the order № 249/од, of 29.04.2021 and corresponding normative documents.

1. EXPLANATORY NOTES

1.1. Place, objectives, tasks of the subject

Place of the academic subject in the system of professional training is determined by the necessity of forming professional competencies in the use of data, their classification, and the use of descriptive and inferential methods of data processing in future specialists. This educational subject is the theoretical and practical basis of the set of knowledge and skills that form the profile of a specialist in the field of management and administration.

The main target of the subject is the formation of professional competencies in the use of data, their classification, the use of descriptive and inferential data processing methods, and the application of regression models in the process of decision-making in the logistics management system of the enterprise, as well as the use of information technologies that simplify data processing.

The objectives of the subject are:

– acquiring theoretical knowledge on data classification and their use in a modern enterprise that provides logistics services;

– application of modern information technologies in data processing;

– formation of management decision-making skills in logistics with the help of data, their qualification and formation of an evidence base when choosing one or another decision;

– application of probability theory for building a decision tree in order to substantiate management decisions at a logistics enterprise;

– formation of skills for predicting and preventing possible risks in order to minimize their impact on the enterprise and eliminate them.

1.2. Learning outcomes the subject makes it possible to achieve

As a result of the study of the subject, the student must achieve the following **learning outcomes (LO)**:

– to identify problems in the organization and justify the methods of solving them (LO2);

– apply specialized software and information systems to solve organizational management problems (LO8);

– to be able to communicate in professional and scientific circles in national and foreign languages (LO9);

– to be able to plan and implement informational, methodical, material, financial and personnel support of the organization (subdivision) (LO13);

– to apply information technologies and information systems to monitor and optimize logistics processes and systems based on the processing of large databases (LO16);

– to apply the methodological tools of business analytics when making management decisions (LO17);

– to identify problems in cost-effective, flexible, reliable supply chains and justify the methods of solving them.

1.3. Competencies the subject makes it possible to acquire

As a result of studying the discipline the student must acquire the following **competencies**:

– ability to solve complex tasks and problems in the field of logistics business process management or in the learning process, which involves conducting research and/or implementing innovations and is characterized by the uncertainty of conditions and requirements (IC1);

– skills in using information and communication technologies (GC3);

– ability to abstract thinking, analysis and synthesis (GC7);

– ability to choose and use management concepts, methods and tools, including in accordance with the defined goals and international standards of supply chain management (PC1);

– ability to analyze and structure organizational problems, make effective management decisions and ensure their implementation (PC9);

– ability to determine the ways and sources of financing, conduct an economic assessment and analysis of social costs and benefits (PC11);

– ability to determine the capacity and evaluate the efficiency of the logistics system (PC13);

– ability to choose methods and tools of data analysis and processing in logistics (PC15);

– ability to business analytics and processing large databases to improve supply chains (networks) (PC16).

1.4. Interdisciplinary connections

Interdisciplinary connections: “Business Analysis and Data Processing” complements the knowledge of such subjects as "Strategic Supply Chain Management" and provides basic knowledge for studying professional management subjects: “Financial Management in Supply Chains”, “Financial Flows in Logistics Systems”, “Risks Management in Global Supply Chains”, “Risk Managements in Logistics” and others.

2. COURSE TRAINING PROGRAM ON THE SUBJECT

2.1. The subject content

Training material is structured according to the module principle and consists of one educational module:

– **module 1 “Data processing and analysis to solve business problems in logistics”**, which is a logically complete, relatively independent, integral part of the curriculum, learning of which provides for modular test and analysis of its implementation.

2.2. Modular structuring and integrated requirements for each module

Module 1 “Data processing and analysis to solve business problems in logistics”

Integrated requirements to the module 1:

Know:

– concepts of data, their classification and sources;
– data measurement levels;
– determination of data in logistics, which are subject to primary statistical processing;
– quantitative data description indicators;
– methods of classification based on the theory of probability and logic;
– confidence intervals for estimating mathematical expectation;
– simplified linear regression models.

Learning outcomes:

– to conduct an analysis of enterprises as subjects of the supply chain;
– to perform primary statistical data analysis;
– to determine data in logistics, which are subject to primary statistical processing;
– to apply a quantitative approach to data processing;
– to apply and interpret quantitative indicators when making decisions in real business situations;
– to build confidence intervals for estimating the value of parameters;
– to apply information technologies to solve problems of building confidence intervals.

Topic 1. Analysis of enterprises-subjects of the supply chain.

Enterprise architecture. Technical and economic justification. Objectives and evaluations. Initial risk assessment. Measurement and reporting. Observation as a method of gathering information.

Topic 2. Data, their classification, data sources.

Definition of data. Quantitative and qualitative data. Data operations. Data elements and observations. Data measurement levels: nominal, ordered, interval, proportional. Cross-functional data and time series. Internal and external data sources. Internet and cyberspace as sources of information. Paid and free sources.

Topic 3. Primary statistical analysis of data.

Visual data transfer. Tabular approach to data processing: frequency distribution, relative frequency distribution, total frequency distribution. Cross tabulation. Application of primary statistical processing in the process of formulating conclusions and their influence on decision-making. Determination of

data in logistics, which are subject to primary statistical processing. Information technologies that facilitate primary data processing. PivotChart reports.

Topic 4. Quantitative approach to data processing.

Quantitative indicators of data description: mathematical expectation, median, mode. Variational methods of data description. Associative methods of data description. Information technologies for calculating quantitative indicators. Examples of application and interpretation of quantitative indicators when making decisions in real business situations.

Topic 5. Methods of classification based on the theory of probability and logic.

The concept of probability. Random search. Discrete distributions. Binary distributions. Concept of logical regularity. Decision tree. Varieties of analytical assessments. Bayesian information criterion (BIC). Bayes' theorem and its application in the decision-making process at enterprises-subjects of the logistics chain.

Topic 6. Construction of confidence intervals for parameter value estimation.

Confidence intervals for estimating the mathematical expectation with known values of the mean square deviation of the population or a large sample size. Confidence intervals for estimating the mathematical expectation for unknown values of the population mean square deviation or a sample size of less than thirty. Confidence Intervals for Estimating Proportions for Nonnumeric Data. Application of information technologies for solving problems of building confidence intervals.

Topic 7. Parametric linear regressions.

A simplified linear regression model. The method of least squares. Coefficients of determination and correlation. Significance test. Regression equation and forecasting. Excel Regression Tool. Interpretation of the estimated regression equation and ANOVA results in the conditions of real business situations.

2.3. Training schedule of the subject

No.	Topic (thematic section)	Academic Hours							
		Full-time				Part-time			
		Total	Lectures	Laboratory classes	Self-study	Total	Lectures	Laboratory classes	Self-study
1	2	3	4	5	6	7	8	9	10
Module №1 „ Data processing and analysis to solve business problems in logistics"									

1	2	3	4	5	6	7	8	9	10
		1 semester				**1 semester**			
1.1	Analysis of enterprises-subjects of the supply chain	14	2 2	2 2	6	13	2	–	11
1.2	Data, their classification, data sources	14	2	2	10	14	2	–	12
1.3	Primary statistical analysis of data	14	2	2	10	14	–	2	12
1.4	Quantitative approach to data processing	14	2	2	10	14	–	2	12
1.5	Methods of classification based on the theory of probability and logic	14	2	2	10	14	2	–	12
1.6	Construction of confidence intervals for parameter value estimation	14	2	2	10	12	–	1	11
1.7	Parametric linear regressions	15	2 1	2	10	14	–	–	14
1.8	Homework (full-time) / Control Work (Homework) (part-time)	–	–	–	–	8	–	–	8
1.9	Module Test №1	6	–	1	5	–	–	–	–
1.10	Final Semester Control Work (part-time)	–	–	–	–	2	–	1	1
Total for the module №1		**105**	**17**	**17**	**71**	**105**	**6**	**6**	**93**
Total for the subject		**105**	**17**	**17**	**71**	**105**	**6**	**6**	**93**

2.4. Control Work (Homework) (part-time)

Control Work (Homework) on the subject is carried out in the first semester, in accordance with the methodical recommendations approved in the established order, with the aim of consolidating and deepening the student's theoretical knowledge and skills in studying the subject.

The task for the performance of Control Work (Homework) (part-time) is carried out by the student individually in accordance with the methodical recommendations developed by the leading teachers of the department.

The time required to complete the Control Work (Homework) (part-time) is 8 hours of self-study.

2.5. List of Final Semester Control Work Questions

The list of questions and the content of the tasks for the preparation for the Final Semester Control Work are developed by the leading teachers according to

Course Training Program, approved by the minutes of the meeting of the department and made known to the students.

3. BASIC CONSEPTS OF GUIDANCE ON THE SUBJECT

3.1. Teaching methods

It is recommended to use the following teaching methods during mastering the subject:

- explanatory-illustrative method;
- method of problem statement;
- reproductive method;
- research method;

The implementation of these methods are carried out during lectures, demonstrations, self-study, work with the educational material, analysis and solution of problems.

3.2. List of references (basic and additional)

Basic literature

3.2.1. Helen Winter. The Business Analysis Handbook: Techniques and Questions to Deliver Better Business Outcomes. Kogan Page Publishers. 2019. 280 p.

3.2.2. Alex Nordeen. Business Analysis: Learn in 24 Hours. Guru99. 2020. 280 p.

3.2.3. A Guide to the Business Analysis Body of Knowledge (BABOK Guide). 2015. 512 p.

3.2.4. Conrad Carlberg. Business Analysis with Microsoft Excel. Que Publishing, 2018 p. 998 p.

3.2.5. Sandhya Jane Business Analysis: The Question And Answer Book. 2017. 320 p.

3.2.6. Fredrik Milani. Digital Business Analysis. Springer, 2019. 429 p.

Additional literature:

3.2.7. Paul Beynon-Davies. Business Analysis and Design: Understanding Innovation in Organisation. Springer Nature. 2021. 409 p.

3.2.8. Krishna G. Palepu, Paul M. Healy, Sue Wright, Michael Bradbury, Jeff Coulton. Business Analysis and Valuation: Using Financial Statements. Cengage AU, 2020. 384 p.

3.3. Internet resource

3.3.1. Microsoft – офіційна домашня сторінка [Electronic resource] – Режим доступу https://www.microsoft.com

3.3.2. Онлайн ресурс mindmeister для складання інтеллект карт [Electronic resource] – Режим доступу https://www.mindmeister.com/

4. RATING SYSTEM OF KNOWLEDGE AND SKILLS ASSESSMENT

4.1. Assessment of certain kinds of student academic activities is carried out in accordance with table 4.1.

4.2. A student gets a credit for the completed assignment if the student's performance has been assessed positively.

Table 4.1

Kind of academic activities	**Max grade**	
	Full-time	**Part-time**
1 semester		
Module 1 «Data processing and analysis to solve business problems in logistics»		
Carrying out practical tasks and analysis of cases	10g. × 7 = 70	20g. × 2 = 40
Carrying out Control Work (Homework) (part-time)	-	30
For carrying out module test №1, a student must receive not less than	42	-
Carrying out Module Test №1	**-**	**30**
Final Semester Control Work (part-time)	**30**	**-**
Total by the Module №1	**100**	**100**
Total by the subject	**100**	

The Graded Test Grade *is determined (in grades and on a national scale) based on the results of all kinds of academic activities during the semester.*

4.3. The total of Grades for individual academic activities completed by a student constitutes a Current Semester Module Grade, which is entered into the Module Control Register.

4.4. The final semester rating is converted into a grade on the national scale and the ECTS scale.

4.5. The Graded Test Grade is entered in an Examination Register, a student's record book and academic card, e.g.: ***92/Ex/A, 87/Good/B, 79/Good/C, 68/Sat/D, 65/Sat./E***, etc.

4.6. The Total Grade on the subject corresponds to the Graded Test Grade.

The Total Grade on the subject is entered into Diploma Supplement.

(Ф 03.02 – 01)

АРКУШ ПОШИРЕННЯ ДОКУМЕНТА

№ прим.	Куди передано (підрозділ)	Дата видачі	П.І.Б. отримувача	Підпис отримувача	Примітки
	УМСНО	14.12.22	Шишкіна Н.Ю	[signature]	
	КМЗЕДП	03.07.23	Сербоган О.С.	[signature]	

(Ф 03.02 – 02)

АРКУШ ОЗНАЙОМЛЕННЯ З ДОКУМЕНТОМ

№ пор.	Прізвище ім'я по-батькові	Підпис ознайомленої особи	Дата ознайом-лення	Примітки

(Ф 03.02 – 04)

АРКУШ РЕЄСТРАЦІЇ РЕВІЗІЇ

№ пор.	Прізвище ім'я по-батькові	Дата ревізії	Підпис	Висновок щодо адекватності

(Ф 03.02 – 03)

АРКУШ ОБЛІКУ ЗМІН

№ зміни	№ листа (сторінки)				Підпис особи, яка внесла зміну	Дата внесення зміни	Дата введення зміни
	Зміненого	Заміненого	Нового	Анульо-ваного			

(Ф 03.02 – 32)

УЗГОДЖЕННЯ ЗМІН

	Підпис	Ініціали, прізвище	Посада	Дата
Розробник				
Узгоджено				
Узгоджено				
Узгоджено				