(Ф 03.02 – 110)

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

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Dean of Faculty of Transport,
Management and Logistics
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«25» 06 2021

APPROVED
Vice-Rector for Academic Affairs
_____ A. Polukhin
«25» 06 2021

Quality Management System
COURSE TRAINING PROGRAM
on
«Informational Systems and Technologies on Transport»

Educational Professional Programs: «Air Transportation Management»
«Multimodal Transport and Logistics»
«Onboard Support of Air Passenger Transportation»

Field of study: 27 «Transport»
Speciality: 275 «Air Transport Technologies»
Specialization: 275.04 «Air Transport Technologies»

Training Form	Semester	Total (hours/credits ECTS)	Lectures	Practicals	Lab. classes	Self-Study	HW/CGP	TP/CP	Semester Grade
Full-time	3	135/4,5	34	–	34	67	HW-3s	–	Examination 3s

Indexes: CB-7-275-1/21-2.1.10
CB-7-275-3/21-2.1.10
CB-7-275-4/21-2.1.10

Course Training Program on «Informational Systems and Technologies on Transport» is developed on the basis of Educational Professional Programs «Air Transportation Management», «Multimodal Transport and Logistics», «Onboard Support of Air Passenger Transportation» Bachelor Curriculum and Bachelor Extended Curriculums №СВ-7-275-1/21, №СВ-7-275-3/21, №СВ-7-275-4/21, №ЕСВ-7-275-1/21, №ЕСВ-7-275-3/21, №ЕСВ-7-275-4/ for Speciality 275 «Air Transport Technologies», Specialization 275.04 «Air Transport Technologies» and corresponding normative documents.

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Discussed and approved by the Graduate Department for Speciality 275 «Air Transport Technologies», Specialization 275.04 «Air Transport Technologies» and Educational Professional Program «Air Transportation Management» - Air Transportation Management Department, Minutes № 12 «09» 06. 2021

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Discussed and approved by the Graduate Department for Speciality 275 «Air Transport Technologies», Specialization 275.04 "Air Transport Technologies", Educational professional programs: «Multimodal Transport and Logistics», «Onboard Support of Air Passenger Transportation» «Aerial Works and Services Management" – Aerial Works and Services Management Department, Minutes № 15 «14» 06 2021

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«21» 06 2021

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INTRODUCTION

Course Training Program on «Informational Systems and Technologies on Transport» 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. Place, objectives, tasks of the subject.

The subject is an integral part of the theoretical basis of knowledge and skills in training specialists of air transportation area, studying the technological subjects.

The objective of the subject is formation of students' system of theoretical knowledge and practical skills of working with modern information systems and technologies used in enterprises and in automated air traffic monitoring and management systems for further training and use in professional activities.

The tasks of the subject are:

- mastering the methods of analysis, processing and storage of documents of the transport company and organization by means of modern DBMS, CRM-systems and WEB-technologies;
- study of modern methods of analysis of information logistics flows, their processing and optimization by tools of modern information technologies and systems.
- study of theoretical and practical bases for operation and implementation of modern information technologies and systems.

1.2. Learning outcomes the subject makes it possible to achieve.

- Take responsibility, show public consciousness, social activity and participation in the life of civil society, think analytically, critically understand the world;
- Apply, use modern information and communication technologies to solve practical problems in the organization of transportation and design of transport technologies;
- Investigate transport processes, experiment, analyze and evaluate the parameters of transport systems and technologies;
- Classify and identify transport processes and systems. Evaluate the parameters of transport systems. Perform system analysis and forecasting of transport systems;
- Investigate the types and types of transport systems. Find solutions for optimizing the parameters of transport systems. Assess the efficiency of infrastructure and technology of transport systems;
- Introduce methods of organizing safe transport activities;
- Critically evaluate the scientific values and achievements of society in the development of transport technologies;
- Choose information systems for transportation. Operate automated control systems and navigation systems in the transportation process. Use electronic cards.

1.3. Competences the subject makes it possible to acquire.

- Skills in the use of information and communication technologies;
- Ability to analyze and predict the parameters and performance indicators of transport systems and technologies, taking into account the impact of the external environment;
- Ability to organize international transportation;
- Ability to use modern information technologies, automated control systems and geographic information systems in the organization of the transportation process;
- Ability to identify insurance cases on air transport, to develop a system of measures to prevent and eliminate them;
- Ability to use professional knowledge and practical skills of technology, organization and management of air passenger traffic to solve engineering problems in production;
- Ability to solve complex specialized problems and solve practical problems in the field of transport using theories and methods of modern transport science based on a systematic approach and taking into account the complexity and uncertainty of the conditions of operation of transport systems;
- Ability to generate new ideas (creativity);
- Ability to work independently and in a team;

- Knowledge and understanding of the subject area and understanding of professional activity.

1.4. Interdisciplinary connections.

This subject is the basis for studying such subjects, as «Higher Mathematics», «Transport Infrastructure», «Transport Vehicles» and is basic for studying subjects, as: «Organization of Databases», «Operation Research on Transport», «Logistics Operations on Transport», «Informational Support of Multimodal Transportation».

2. COURSE TRAINING PROGRAM ON THE SUBJECT

2.1. The subject content.

Training material is structured according to module principle and consists of **two educational modules, Module № 1 «Modern Informational Technologies on Transport»**

Module № 2 «Functionality and application of Informational Systems», that are logically complete, relatively independent, holistic part of the subject, learning of which provides module test and analysis of its performance.

2.2. Modular structuring and integrated requirements for each module.

Module № 1 «Modern Informational Technologies on Transport»

Integrated requirements to module №1:

As a result of studying the module the student must

know:

- basic concepts and definitions of information theory, the essence of information technology and their importance in the management of modern transport organizations;
- directions of use of modern information technologies in management and dispatching systems of the enterprise;
- structure, functions and capabilities of information technologies;
- technologies of logistics management and cargo identification;
- prospects for the development of modern information technologies.

be able to:

- design the structure of the organization's database;
- plan the stages of development and implementation of automated information systems in the organization;
- use modern information technology for the presentation and advertising of companies, goods and services;
- analyze, process and store information in MS Access, MS Excel, Outlook, Web Access;
- create and edit documents of the transport company.

Topic 1. Information as the basis for modern technologies.

Subject and objectives of the course. Basic terms and definitions. Goals and objectives of information technology. Forms and documents for submitting information. Types of information. Criteria for evaluating information.

Topic 2. Information processes of transport logistics.

Organizational and information structure of organization management. Document flow in a transport company. Information technologies to ensure the activities of transport companies.

Topic 3. System analysis of information technologies.

The concept of properties and levels of information technology. Properties, functions and structure of typical information technology. Modern classification of information technologies.

Topic 4. Information technologies in transport logistics.

Classification of logistics information technologies, Web-technologies as a tool for solving logistics problems. Cloud technologies. Virtual logistics centers.

Topic 5. Analysis, processing, and storage of information, documents of the transport company.

Basics of working with Microsoft Office information tools - MS Access, MS Excel, Outlook, Web Access.

Topic 6. Basics of preparation of documents and reports.

Create and edit templates and forms. Preparation of reports and other documents.

Topic 7. Logistics management and cargo identification technologies.

Classification and functionality of logistics management technologies, contactless identification technologies.

Topic 8. Modern information technologies for managing information processes of the enterprise.

Satellite technologies, PLM - technologies, "Logistics 4.0", Internet of Things, "Smart" technologies, equipment and transport.

Module № 2 «Functionality and application of Informational Systems»

Integrated requirements to module №2

As a result of studying the module the student must

know:

- classification, functions and possibilities of using information ERP, CRM, HRM, PDM and modern integrated logistics systems;
- methods of implementation and operation of integrated logistics systems;
- basics of practical use of modern information systems to solve problems of transport logistics;
- prospects for the development of modern integrated logistics systems for transport companies and organizations.

be able to:

- to analyze modern technical means and elements of modern information systems;
- to make a choice of adequate technical means, algorithms and corresponding programs at creation of modern systems of monitoring and management of the enterprise;
- to develop, substantiate, adjust and document the documents of the enterprise by means of information systems;
- make decisions on the selection and use of software tools for the management of the transport company.

Topic 1. Definition, classification and structural components of information systems.

Terms, definitions and classification of information systems. Structural and functional schemes of transport logistics systems. Typical system components.

Topic 2. Integrated ERP-enterprise management systems.

Production resource planning systems from MRP to MRP-II. The main functions of ERP-systems.

Topic 3. Software modules "Logistics" in modern ERP-systems.

Transport logistics management in ERP-system, SAP-S / 4HANA, Oracle E-Business Juite ERP-system, Ukrainian ERP-system IT -enterprise.

Topic 4. Integrated logistics CRM systems.

SCP-supply chain management systems CRM + ERP system Perfectum (Ukraine) Iow-code platform Creatio and CRM from Terrasoft. Leading CRM-systems in the market of logistics services.

Topic 5. Human resources management by means of HPM-system.

Levels of automation of human resources management. Structures, functionality and capabilities of systems. Online HPM systems. Domestic HPM systems.

Topic 6. RDM-systems of information processes and production document management.

Information document flow of transport companies. Unified information environment. Digital transformation of information. Examples of the use of domestic and foreign RDM-systems in logistics and aviation enterprises.

Topic 7. Methods of implementing an integrated information system in a logistics company.

The sequence of stages of implementation of information systems. Use of cloud technology databases and online technologies.

Topic 8. Problems of choosing the implementation and operation of integrated logistics systems.

Choice of systems. Factors of success of implementation. Problematic issues of operation and training. Work with consulting companies. Examples of successful operation of integrated logistics systems.

Topic 9. Prospects for the development of information technology systems

Integrated operating system of the enterprise IEM-systems. Digital transformation of information and information flows. Virtual CALL-centers. Cloud technologies in transport logistics.

2.3. Training schedule of the subject.

№	Theme (thematic section)	Total, hours			
		Total	Lectures	Labs	Self-study
1	2	3	4	5	6
Module № 1 «Modern Informational Technologies on Transport»					
1.1	Information as the basis for modern technologies	**3 semester** **7**	2	2	3
1.2	Information processes of transport logistics	**7**	2	2	3
1.3	System analysis of information technologies.	**7**	2	2	3
1.4	Information technologies in transport logistics.	**7**	2	2	3
1.5	Analysis, processing, and storage of information, documents of the transport company.	**7**	2	2	3
1.6	Basics of preparation of documents and reports.	**7**	2	2	3
1.7	Logistics management and cargo identification technologies.	**8**	2	2	4
1.8	Modern information technologies for managing information processes of the enterprise.	**6**	2	-	4
1.9	Module Test №1	**6**	-	2	4
Total by the module № 1		**62**	**16**	**16**	**30**
Module № 2 «Functionality and application of Informational Systems»					
2.1	Definition, classification and structural components of information systems.	**7**	2	2	3
2.2	Integrated ERP-enterprise management systems.	**7**	2	2	3
2.3	Software modules "Logistics" in modern ERP-systems.	**7**	2	2	3
2.4	Integrated logistics CRM systems.	**7**	2	2	3
2.5	Human resources management by means of HPM-system.	**7**	2	2	3
2.6	RDM-systems of information processes and production document management.	**7**	2	2	3
2.7	Methods of implementing an integrated information system in a logistics company.	**7**	2	2	3
2.8	Problems of choosing the implementation and operation of integrated logistics syste	**7**	2	2	3
2.9	Prospects for the development of information technology systems	**5**	2	-	3
2.10	Homework	**8**	-	-	8
2.11	Module Test №2	**4**	-	2	2
Total by the module №2		**73**	**18**	**18**	**37**
Total by the subject		**135**	**34**	**34**	**67**

2.4. Homework.

Homework (HW) in the discipline is performed in order to consolidate and deepen theoretical and practical knowledge and skills in the use of information technology, modern databases for the preparation of documents of the transport and logistics organization.

The purpose of HW is to perform individual tasks for the preparation of documents and reports of transport and logistics organizations by means of modern information technologies and systems.

To successfully perform HW the student must **know**: basic concepts and definitions of information theory, the essence of information technology and their importance in the management of modern transport organizations, the use of modern information technology in enterprise management and control systems, structure, functions and capabilities of information technology, logistics management technology and cargo identification,

be able to: design the structure of the organization's database, plan the stages of development and implementation of automated information systems in the organization, use modern information technology for presentation and advertising of companies, goods and services, analyze, process and store information in MS Access, MS Excel, Outlook, Web Access; create and edit transport company documents**.**

Completion, registration and defense of HW is carried out by the student individually according to methodical recommendations.

The time required to complete HW is up to 8 hours of individual work.

3. BASIC CONSEPTS OF GUIDANCE ON THE SUBJECT

3.1. Teaching methods

The following teaching methods of subject guidance are

–- explanatory and illustrative method;

–- method of problem presentation;

–- reproductive method;

–- research method.

The implementation of these methods are carried out during lectures, demonstrations, self-study, work with the educational material, analysis of transport technologies issues.

3.2. List of references (basic and additional)

Basic literature

3.2.1.Інформаційні системи і технології : навч. посіб. / [П. М. Павленко, С. Ф. Філоненко, К. С. Бабіч та ін.]. – К. : НАУ, 2018. – 324 с.

3.2.2 Ситнік Б. Т. Основи інформаційних систем і технологій: Навч. посібник. – Харків: УкрДУЗТ, 2019. – 175 с., рис. 27, табл. 7. ISBN.

3.2.3. Кір'янов О. Ф. Інформаційні технології на автомобільному транспорті : навч. посіб. / О. Ф. Кір'янов, М. М. Мороз, Ю. О. Бойко; Кременчуц. нац. ун-т ім. М. Остроградського. - Харків : Друкарня Мадрид, 2015. - 270 с.

3.2.4. Сістук В. О. Опорний конспект лекцій з дисципліни «Сучасні інформаційні технології на транспорті» для студентів спеціальності 274 «Автомобільний транспорт» всіх форм навчання [В.О. Сістук]. – Кривий Ріг, ДВНЗ «КНУ», 2018. –51 с.

Additional Literature

3.2.5. Мигаль В. Д. Інтелектуальні системи в технічній експлуатації автомобілів: монографія / В. Д. Мигаль. Х.: Майдан, 2018. – 262 с.

3.2.6.О. М. Тимощук, О. В. Мельник , Журнал “Інвестиції: практика та досвід”, Інформаційно-логістичні системи в сучасних транспортних технологіях, № 22 2015, стор. 79 – 82, Рубрика: Економіка [Електронний ресурс]. – Режим доступу: http://www.investplan.com.ua/pdf/22_2015/18.pdf

3.2.7.Методичні вказівки щодо виконання лабораторних робіт з навчальної дисципліни «Інформаційні технології МРЕВ» для студентів денної та заочної форм навчання/ Кір’янов О. Ф., Кузєв І. О. – Кременчук: КрНУ, 2018. 49 с.

3.2.8.Методичні вказівки щодо самостійної роботи з навчальної дисципліни «Інформаційні технології МРЕВ» для студентів денної та заочної форм навчання/ Кір’янов О. Ф. – Кременчук: КрНУ, 2019. 20 с.

3.2.9.Методичні вказівки щодо виконання контрольної роботи з навчальної дисципліни «Інформаційні технології МРЕВ» для студентів та заочної форм навчання/ Кір’янов О. Ф. – Кременчук: КрНУ, 2019. 14 с.

3.3. Internet Information resource

3.3.1. http://utg.ua

3.3.2. http://www.avid.ru/eks/diag/

3.3.3. http://jrnl.nau.edu.ua/index.php/visnik

4. RATING SYSTEM OF KNOWLEDGE AND SKILLS ASSESSMENT

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

Table 4.1

Kind of Academic Work	**Maximum Grade Values**	**Kind of Academic Work**	**Maximum Grade Values**
3 semester			
Module № 1 «Modern Informational Technologies on Transport»		**Module № 2 «Functionality and application of Informational Systems»**	
Kind of Academic Work	points	**Kind of Academic Work**	points
Carrying out Labs (3б x 7)	21 (total)	Carrying out Labs (3б x 8)	24 (total)
		Completion of the Homework	10
For admission to complete module test №1, a student must receive not less than	*13 points*	*For admission to complete module test №1, a student must receive not less than*	*20 points*
Module Test №1	9	Module Test №2	16
Total by the module №1	**30**	**Total by the module №2**	**50**
Total by the modules №1, №2			**80**
Semester Examination			**20**
Total by the subject			**100**

4.2. Completed types of educational work are credited to the student, if he received a positive rating for them.

4.3. The sum of rating assessments received by the student for certain types of completed academic work is the current modular rating assessment, which is recorded in the module control.

4.4. The final modular rating obtained by the student based on the results of the course defense and defense in points, on the national scale and ECTS scale is entered in the module control, as well as in the study card, individual student curriculum and Diploma Supplement, for example, as follows: ***92 / Excellent / A, 87 / Good / B, 79 / Good / C, 68 / Sat./D, 65 / Sat./E, etc.***

4.6. The Total Grade for the subject is equal to the average grade from Total Semester Grades with its further transformation into national scale and ECTS system.

The Total Grade is recorded to the Diploma Appendix

(Ф 03.02 – 01)

АРКУШ ПОШИРЕННЯ ДОКУМЕНТА

№ прим.	Куди передано (підрозділ)	Дата видачі	П.І.Б. отримувача	Підпис отримувача	Примітки

(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 введен-ня зміни
	Зміненого	Заміненого	Нового	Анульо-ваного			

(Ф 03.02 – 32)

УЗГОДЖЕННЯ ЗМІН

	Підпис	Ініціали, прізвище	Посада	Дата
Розробник				
Узгоджено				
Узгоджено				
Узгоджено				