

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

APPROVED

Vice-Rector for Academics

_____ A. Gudmanian

«__» _____ 2019.



Quality Management System

COURSE TRAINING PROGRAM

on

«Fundamentals of the Transportation Process Theory»

Field of Study: 27 «Transport»

Major: 275 «Transport Technologies (by air transport)»

Specialty: 275.4 «Transport Technologies (by air transport)»

Educational Professional Programs: «Organization of the Transportation and Management (by air transport)»

«Organization of the Aviation Operations and Services»

«Automation and Automatization of the Aviation Operations and Services»

«Multimodal Transport and Logistics»

«Transport Systems (by air transport)»

Year of Study – 2 Semester – 3

Lectures – 17

Examination – Semester 3

Practicals – 34

Self-Study – 69

Total (hours/ECTS credits) – 120/4,0

Index: ECB-7-275/17-2.1.10



The Course Training Program on «Fundamentals of the Transportation Process Theory» is based on the Educational program and Bachelor Extended Curriculum №ECB-7-275/17 for Specialty 275.4 «Transport Technologies (by air transport)», Educational Professional Programs «Organization of the Transportation and Management (by air transport)», «Organization of the Aviation Operations and Services», «Automation and Automatization of the Aviation Operations and Services», «Multimodal Transport and Logistics», «Transport Systems (air transport)», Ukrainian version of the Course Training Program on «Fundamentals of the Transport Process Theory» approved by Vice-Rector for Academics _____, and corresponding normative documents (order №207/од of 27.04.18).

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AGREED
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O Ilienکو
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INTRODUCTION

The Course Training Program of the discipline «Fundamentals of the Transport System Process Theory» developed based on the «Methodological guidelines for development and performance of the Course Training Program», approved by the order №106/поз, of 13.07.2017 and corresponding normative documents.

1. EXPLANATORY NOTE

1.1. Planned Results

Subject «Fundamentals of the Transportation Process Theory» completes educational process of special disciplines systems theoretical and practical training specialist for Major 275 «Transport Technologies (by air transport)», Specialty 275.04 «Transport Technologies (by air transport)» and Educational Professional Programs «Organization of the Transportation and Management (by air transport)», «Organization of the Aviation Operations and Services», «Automation and Automatization of the Aviation Operations and Services», «Multimodal Transport and Logistics», «Transport Systems (air transport)».

The aim of the subject teaching is crating of the knowledge and skills for the practical use of the general theory of transportation process at planning of transport systems, organization of the passenger and cargo transportation and cooperation between different modes of transport.

The tasks of studying the subject are:

- defining the basic concepts of a transport process, elements of a transport system;
- understanding of the basic methods and principles of transport processes organization;
- determination of the patterns of development of transport processes and indexes of the effective use of the rolling stock.

As the result of studying the discipline «Fundamentals of the Transport System Process Theory» the students must obtain the following **competences**:

- ability to analyze and forecast parameters and indicators of the transport systems and technologies functioning considering the environmental impact;
- ability to use professional knowledge and practical skills in transport optimization and management and technological schemes of the aviation transport as well;
- ability to use aviation terminology in solving professional tasks.

Interdisciplinary links

The academic discipline «Fundamentals of the Transport System Process Theory» is complemented by such disciplines as «Systems analysis», «General Couse of Transport», being the basis for learning such disciplines as «Transport Operational Research», «Information Technologies and Systems».

1.2. Course Training Program

The educational material of the discipline is structured modularly and consists of 2 educational modules, namely:

Module 1. «General Provisions on Transport Processes and Systems».

Theme 1. General concepts of transport, transport process

The levels of transport development. The world complex of the transport. The generalized opportunities and problems in the transport industry of the country. The basic terminology of the course. The transport network performance indicators. The characteristics of transport modes, forming the transport system (TS) of the country.

Theme 2. The characteristics of the Transport System

Definition of the Transport System. Transport policy of developed countries - as important component of the national strategy. The main principles of European transport policy. Indicators of power of equipping of the TS. Indicators of transport operation. Technical and operational



indicators. Economic indicators of the TC. Indicators characterizing the quality of the transport services. Structural and functional characteristics of the transport. Concept of the Aviation Transport System (ATS), its structure. Airport as part of aviation transport system. Factors of improving the air transportation within the ATS of Ukraine.

Theme 3. The patterns of functioning and development of the transport system. Determination of demand and supply in the market of transport services.

Factors influencing to the development of the world transport system. Issues and prospects of the Ukrainian transport and logistics system development. Scheme for the development of the transport complex of Ukraine. The current situation on the transport and logistics system of Ukraine. Regional programs for the development of the territorial structure for European logistics . The concept of supply and demand in the market of transport services. Overview of methods for determining of the demand for transport services.

Theme 4. The Transport Systems structure. Basic ways to determine the capacity of TS elements.

Levels of transport systems complexity. Functional, sectoral, territorial structures of the transport systems. Concept, functions and structure of transport nodes. Different schemes of cargo and passenger turnover. Approaches to determination of the carrying capacity of TS elements. Calculation of theoretical capacity of the transport network elements.

Module 2. «The assessment of effective use of the rolling stock and the aircraft».

Theme 1. The vehicles productivity. Energy consumption of the rolling stock, factors that determine it.

Concepts and types of vehicle productivity. Factors on which the use of vehicles depends. Ways to improve the productivity of vehicles. Calculation of the rolling stock productivity on the route. Structure of energy consumption in transport. Ways of energy saving on transport. Perspective directions for using the alternative fuel in motor transport and air transport.

Theme 2. The operational indicators for using the rolling stock and the aircraft.

System of operational indicators of the fleet of the rolling stock. The concept of commercial loading, static loading, dynamic loading. Characteristics of the rolling stock fleet. Analysis of the effective use of the fleet of the rolling stock. Analysis of the operational characteristics of the aircraft.

Theme 3. The rational use of the transport means.

The rational use of the transport means for cargo transportation. The structure of the cargo fleet of the rolling stock. Distribution of rolling stock in the cargo transportation. The process of passenger transportation and the rational use of the transport modes fleet. The structure of the passenger of the rolling stock fleet. The distribution of the rolling stock in passenger transportation.

Theme 4. The interaction features of the transport nodes.

Organization of work in the transport nodes. Indicators of the transport nodes operation, their loading. The operational experience of the transport nodes. The methods of organization of the work used to improve the efficiency of the goods delivery process in the transport nodes.



2. SUBJECT CONTENT

2.1. Subject Structure

№	Theme	Academic hours			
		Total	Lectures	Practicals	Self-Study
1	2	3	4	5	6
Semester 3					
Module №1 «General Provisions on Transport Processes and Systems»					
1.1	General concepts of transport, transport process	13	2	4	7
1.2	The characteristics of the Transport System	13	2	4	7
1.3	The patterns of functioning and development of the transport system. Determination of demand and supply in the market of transport services	13	2	4	7
1.4	The Transport Systems structure. Basic ways to determine the capacity of TS elements	13	2	4	7
1.5	Module Test №1	9	-	2	7
Total by Module №1		61	8	18	35
Module №2 «The assessment of effective use of the rolling stock and the aircraft»					
2.1	The vehicles productivity. Energy consumption of the rolling stock, factors that determine it	15	4	4	7
2.2	The operational indicators for using the rolling stock and the aircraft	13	2	4	7
2.3	The rational use of the transport means	13	2	4	7
2.4	The interaction features of the transport nodes	10	1	2	7
2.5	Module Test №2	8	-	2	6
Total by Module №2		59	9	16	34
Total by the 3 semester		120	17	34	69
Total by the discipline		120	17	34	69



2.2. Lectures, their Subject Matter and Planned Hours

№	Theme	Academic hours	
		Lectures	Self-Study
3 semester			
Module №1 «General Provisions on Transport Processes and Systems»			
1.1	The concept of transport, transport process. World transport complex	2	2
1.2	General indicators of transport systems	2	2
1.3	The development features of the transport complex of Ukraine	2	2
1.4	The Transport Systems structure	2	2
Total by Module №1		8	8
Module №2 «The assessment of effective use of the rolling stock and the aircraft»			
2.1	The vehicles productivity	2	1
2.2	Energy consumption of the rolling stock	2	1
2.3	The operational indicators for using the transport modes	2	2
2.4	The rational use of the transport means	2	2
2.5	The interaction features of the transport nodes	1	3
Total by Module №2		9	9
Total by the discipline		17	17

2.3. Practicals, their Subject and Planned Hours

№	Theme	Academic hours	
		Practicals	Self-Study
Semester 3			
Module №1 «General Provisions on Transport Processes and Systems»			
1.1	Characteristics of the transport modes, forming the transport system of the country	2	2
1.2	Prerequisites for effective interaction of different modes of transport	2	3
1.3	Modern Trends and Principles of the International Transport Policy	2	2
1.4	Determination of the main elements of the aviation transport system	2	3
1.5	Analysis of the regional programs for the development of the territorial structure for eurologistics	2	2
1.6	Determination of the demand and the supply in the market of transportation services	2	3
1.7	The concept of cargo flows, their characteristics, the development of the cargo turnover	2	2
1.8	Determination of the transport network capacity elements	2	3
1.9	Module Test №1	2	7
Total by Module №1		18	27
Module №2 «The assessment of effective use of the rolling stock and the aircraft»			
2.1	Calculation of the rolling stock productivity on the route	2	2
2.2	Monitoring of the alternative energy sources in aviation and ground transport means	2	3
2.3	Analysis of the system of the operational indicators for the rolling stock fleet	2	2
2.4	Analysis of the effective use of the rolling stock fleet	2	3



2.5	Definition of the rolling stock specialization	2	2
2.6	Determination of the optimal structure of the rolling stock fleet	2	3
2.7	Analysis of the methods of organization of work in transported nodes	2	4
2.8	Module Test №2	2	6
Total by Module №2		16	25
Total by the discipline		34	52

2.4. Self-Study, its Content and Planned Hours

№	Subject of the Student Self-study	Academic hours
Semester 3		
1.	Studying of the lecture material	17
2.	Preparation for practical sessions	39
3.	Preparation for the module tests №1, №2	13
Total by the discipline		69

3. BASIC CONCEPTS OF GUIDANCE ON THE SUBJECT

3.1. Teaching Techniques

The process of training embraces the following teaching techniques: work in small groups, seminar-discussion, brainstorming, case study method, presentation, business game. All these methods are applied in order to contribute to a student's educational and cognitive activity in the course of learning.

3.2. Recommended Literature

Basic Literature

3.2.1. Дмитриченко М.Ф., Яцківський Л.Ю., Ширяєва С.В., Докуніхін В.В. Основи теорії транспортних процесів і систем: Навчальний посібник для ВНЗ. – К.: Видавничий Дім «Слово», 2009. – 336 с.

3.2.2. Яцківський Л.Ю., Зеркалов Д.В. Загальний курс транспорту. Книга 2. Навчальний посібник – К.: Арістей, 2007. – 504 с.

3.2.3. Горбачев П.Ф., Дмитриев И.А. Основы теории транспортных систем: Учебное пособие. – Харьков: Изд-во ХНАДУ, 2002. – 202 с.

3.2.4. Горев А.С. Основы теории транспортных систем. Учебное пособие. – СПб.: СПбГАСУ, 2010. – 214 с.

3.2.5. Зеркалов Д.В. Транспорта система України. Довідник. – К.: Основа, 2007. – 620 с.

Additional references

3.2.6. Марінцева К.В. Наукові основи та методи забезпечення ефективного функціонування авіатранспортних систем: монографія / К.В. Марінцева. – К.: НАУ, 2014. – 504 с.

3.2.7. Зеркалов Д.В., Коба В.Г., Кушнірчук В.Г., Петров В.І. Порти України. Перевезення вантажів. Навчальний посібник. – К.: Основа, 2003. – 624 с.

3.2.8. Коцюк О.Я. Взаємодія видів транспорту. – К.: УТУ, 1999. – 107 с.

3.2.9. Логистические транспортно-грузовые системы. Под ред. Николашина В.М. – М.: Академия, 2003. – 304с.

3.2.10. Новикова А.М. Україна в системі транспортних коридорів. – К.: Київ, 2003. – 494 с.

3.2.11. Транспортная логистика / Под ред. Л.Б.Миротина. – М.: Экзамен, 2002. – 512 с.

3.3. Internet Information Resources



- 3.2.12. [https:// www.twirpx.com/file/205533/](https://www.twirpx.com/file/205533/).
3.2.13. <http://elartu.tntu.edu.ua/handle/lib/21524>.
3.2.14. <http://elib.chdtu.edu.ua/vocabulary4/3899>.
3.2.15. <http://umm.pstu.edu/handle/123456789/14058>.

4. RATING SYSTEM OF KNOWLEDGE AND SKILLS ASSESSTMENT

4.1. The assessment of different kinds of academic work done by the student and obtained knowledge and skills performed in points according to the table. 4.1.

Table 4.1

Semester 3				
Module №1		Module №2		Max Score
Academic Activities	Max points	Academic Activities	Max points	
Performing tasks during practical's 1.1-1.8	24 (Total)	Performing tasks during practical's №2.1-2.7	21 (Total)	
Performing test tasks	10 (Total)	Performing test tasks	13 (Total)	
<i>For admission to the implementation of modular control №1 student must score at least 21 points</i>		<i>For admission to the implementation of modular control №2 student must score at least 21 points.</i>		
Module Test №1	10	Module Test №2	10	
Total by module №1	44	Total by module №2	44	
Semester examination test				12
Total by the 3 semester				100

4.2. Performing of the certain kinds of academic works should be credited to the student in case if he received a positive rating (table 4.2).

Table 4.2

Correspondence between Rating Scores and National Scale Ratings

Grade, points					National Scale Rating
Performing tasks during practical's		Performing the test tasks	Module Tests		
№1.1-1.8	№2.1-2.7				
22-24	19-21	9-10	12-13	9-10	Excellent
18-21	16-18	8	10-11	8	Good
15-17	13-15	6-7	8-9	6-7	Satisfactory
less then 15	less then 13	less then 6	less then 8	less then 6	Bad

4.3. The sum of the grades, obtained by the student for certain kinds of academic works, is current and module test ratings, and transfers to the module tests control records.

4.4. The sum of the current and module grades ratings is total module grade (table 4.3), in points and by the national scale and transfers to the module tests control records.


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Table 4.3

Correspondence between the Total Module Rating Scores and National Scale Ratings

Module №1	Module №2	National Scale Rating
40-44	40-44	Excellent
33-39	33-39	Good
27-32	27-32	Satisfactory
less than 27	less than 27	Bad

4.5. The sum of the total module grades is total semester module grades, and should be calculated in national scale (table 4.4)

Table 4.4

Correspondence between the Total Semester Module Rating Scores and National Scale Ratings

Rating Score	National Scale Rating
79-88	Excellent
66-78	Good
53-65	Satisfactory
less than 53	Bad

Table 4.5

Correspondence between the Examination Rating Score and National Scale Rating

Rating Score	National Scale Rating
11-12	Excellent
9-10	Good
7-8	Satisfactory
less than 7	Bad

4.6. The sum of the total semester module test and examination grade is total semester grade, and should be calculated in national scale and ECTS (table 4.6).

Table 4.6

Correspondence between the Total Semester Rating Score, National Scale Rating and ECTS Scale

Score	National Scale Rating	ECTS Scale Rating	
		Rating	Comments
90-100	Excellent	A	Excellent (excellent performance with few minor mistakes)
82-89	Good	B	Very Good (performance above the average with a number of mistakes)
75-81		C	Good (good performance on the whole, with a number of gross mistakes)
67-74	Satisfactory	D	Satisfactory (not bad, with a considerable number of mistakes)
60-66		E	Sufficient (performance meets the minimal criteria)
35-59	Bad	FX	Bad (bad performance; a second testing is required)
1-34		F	Bad (very bad performance; a student shall redo the course)

4.7. The total semester module grade in the national scale and ECTS is to be entered to the examination records, students card and students record book.

4.8. The total semester module grade is to be entered to the students card and students record book, i.e: **92/EX/A**, **87/Good/B**, **79/Good/C**, **68/Sat./D**, **65/ Sat./E** etc.

4.9. The total grade for the discipline, which is taught during one semester, is equal to the total semester module grade.

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The above-mentioned total grade for the discipline is to be entered to the Diploma Annex.



(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 ознайомлення	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 зміни	Дата внесення зміни	Дата введення зміни
	Зміненого	Заміненого	Нового	Анульованого			

(Ф 03.02 – 32)

УЗГОДЖЕННЯ ЗМІН

	Підпис	Ініціали, прізвище	Посада	Дата
Розробник				
Узгоджено				
Узгоджено				
Узгоджено				



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