

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


AGREED

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 «25» 06 2021 A. Polukhin



Quality Management System
COURSE TRAINING PROGRAM
 on

«Ergonomic provision of transport processes»

Educational Professional Program: «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	6	105/3,5	17	-	34	54	-	-	Graded Test 6s

Index: CB-7-275-1/21-2.1.19

CB-7-275-3/21-2.1.19

CB-7-275-4/21-2.1.19

QMS NAU CTP 19.01–01–2021



Quality Management System.
Course Training Program
on
«Ergonomic Provision of Transport
Processes»

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QMS NAU CTP 19.01-01-
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Page 2 of 9

Course Training Program on «Ergonomic provision of transport processes» is developed on the basis of Educational Professional Program «Air Transportation Management», «Multimodal Transport and Logistics», Onboard Support of Air Passenger Transportation», Bachelor Curriculum and Bachelor Extended Curriculums №CB-7-275-1/21, №CB-7-275-2/21, №CB-7-275-3/21, №CB-7-275-4/21, №ECB-7-275-1/21, №ECB-7-275-2/21, №ECB-7-275-3/21, №ECB-7-275-4/21 for Speciality 275 «Air Transport Technologies» and corresponding normative documents.

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	Quality Management System. Course Training Program on «Ergonomic Provision of Transport Processes»	Document Code	QMS NAU CTP 19.01-01- 2021
		Page 3 of 9	

CONTENTS

Introduction	4
1. Explanatory notes.....	4
1.1. Place, objectives, tasks of the subject	4
1.2. Learning outcomes the subject makes it possible to achieve.....	4
1.3. Competences the subject makes it possible to acquire	4
1.4. Interdisciplinary connections	4
2. Course training program on the subject	4
2.1. The subject content.....	5
2.2. Modular structuring and integrated requirements for each module	5
2.3. Training schedule of the subject	5
3. Basic concepts of guidance on the subject.....	9
3.1. Teaching methods.....	9
3.2. List of references (basic and additional).....	10
3.3. Internet resources.....	
4. Rating system of knowledge and skills assessment	11

	Quality Management System. Course Training Program on «Ergonomic Provision of Transport Processes»	Document Code	QMS NAU CTP 19.01-01- 2021
		Page 4 of 9	

INTRODUCTION

Course Training Program on «Ergonomic support of transport processes» 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.

The subject "Ergonomic support of transport processes" is a theoretical and practical basis of a set of knowledge, skills and abilities that form the worldview and profile of a specialist in the field of system efficiency of transport processes through the study of ergatic complex "machine-operator-environment".

The objective of the subject of the discipline "Ergonomic support of transport processes" is to provide students with modern knowledge and principles of ergonomics and scientific methods of studying the relationships and interactions between the components of the ergatic transport system.

The tasks of the subject are:

- providing students with an understanding of the systemic scientific and practical meaning of the science of ergonomics;
- ensuring the study of modern indicators that allow to assess the state and determine the directions of development of the efficiency of the ergatic transport system;
- providing knowledge about the existence of limited human capabilities, the relationship between the biologically determined limitations of man as a specialist and the ergonomic efficiency of his work on the operation of technical devices;
- providing future specialists and scientists with a tool to study the efficiency and optimization of ergatic transport systems;
- promoting the development of students' logical thinking and the formation of a systematic approach in the formulation and solution of theoretical and practical issues in general and aviation ergonomics.

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

The resulting competence in ergonomic support of transport processes in the future should be used in the study of disciplines in the organization of transport processes and systems, coursework, research, as well as in future practical activities in the specialty 275 "Transport Technology".

1.3. Competences the subject makes it possible to acquire.

- Ability to evaluate and ensure the efficiency of ergatic transport systems;
- 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 design ergatic transport (transport-production, transport-warehousing) systems and their individual elements.

1.4. Interdisciplinary connections.


The subject is based on following subjects, as: "General course of transport", "Technical and economic research of transport development" and is the basis for the study of further disciplines, namely: "Transport and logistics systems and processes", "Efficiency of air transportation".

2. COURSE TRAINING PROGRAM ON THE SUBJECT

2.1. The subject content.

Training material is structured according to module principle and consists of training module № 1 "Ergonomics of transport systems and processes", which is a logically complete, relatively independent, integral part of the discipline, the assimilation of which involves a modular test and analysis of the results of its implementation.

2.2. Modular structuring and integrated requirements for each module.

	Quality Management System. Course Training Program on «Ergonomic Provision of Transport Processes»	Document Code	QMS NAU CTP 19.01-01- 2021
		Page 5 of 9	

Module № 1 "Ergonomics of transport systems and processes"

Integrated requirements of module №1:

Know:

- standards and genesis of ergonomics;
- definitions and terminology on ergonomics and ergatic transport systems;
- patterns of causes and consequences of the interaction of the components of the ergonomic system.

Be able:

- to determine the characteristics of the components of the ergatic transport system;
- use the features of the relationship between the limited human capabilities of the specialist (aviation specialist) and the efficiency of ergatic transport;
- to study the state of the ergatic transport system through the definition of its main indicators and entropy, to develop recommendations for the development of the transport system.

Topic 1. Characteristics of ergonomics as a science.

Basic definitions of the discipline "Ergonomic support of transport processes" and its place in the system of sciences. Genesis of ergonomics. Components of ergatic systems. Ergonomics standards.

Topic 2. Component human operator in the ergatic transport system.

Man in the transport system. Characteristics of the operator operator as a multicriteria object. Anthropometric, physiological, biomechanical, psychophysiological characteristics of the operator. Operator efficiency.

Topic 3. Component "machine (technology) ergatic transport system.

Characteristics of the machine (technology) of ergatic transport systems and processes. Correspondence of machines and mechanisms to anthropometric and psychophysiological characteristics of operators of transport systems and processes. The efficiency of the block "machine operator (person)"

Topic 4. Component "environment" of the ergatic transport system.

Characteristics of the environment of ergatic transport systems and processes. The structure of the environment. Working environment: 1) corporate culture, technologies, personnel management system of the transport enterprise; 2) the natural environment of transport systems; 3) elements of labor protection in the transport sector. The influence of the environment on the efficiency of the ergatic transport system.

Topic 5. Working conditions in the working environment of transport systems.

Occupational safety and basics of BJD in the transport industry. Standards of working conditions in accordance with positions in ergatic transport systems. Influence of working conditions on efficiency

Topic 6. The efficiency of the operator in the information flows of transport systems and processes


Information flows in transport systems. Fundamentals of queuing theory. Efficiency of the transport system operator. Queues and their impact on operator efficiency

Topic 7. Efficiency of ergatic transport systems and processes.

The concept of efficiency of ergatic transport systems and processes. Causation Economic feasibility and efficiency. Market, social and other types of efficiency of transport systems and processes.

Topic 8. Entropy of ergatic transport systems and processes.

Systems for assessing the state of ergatic transport systems. Balanced scorecard. Integrated assessment of ergatic transport systems. Shannon's formula. Turbulence in transport systems as a result of differences in the speeds of information, operational and transport processes. Innovation and redistribution of functions between the components of the ergatic transport system.

	Quality Management System. Course Training Program on «Ergonomic Provision of Transport Processes»	Document Code	QMS NAU CTP 19.01-01- 2021
		Page 6 of 9	

2.3. Training schedule of the subject.

№	Theme (thematic section)	Total, hours			
		Total	Lectures	Practicals	Self-study
1	2	3	4	5	6
Module № 1 «Transport systems of the world»					
1.1	Characteristics of ergonomics as a science	1 semester			
		12	2	2 2	6
1.2	Component human operator in the ergatic transport system	12	2	2 2	6
1.3	Component "machine (technology) ergatic transport system	12	2	2 2	6
1.4	Component of the "environment" of the ergatic transport system	12	2	2 2	6
1.5	Working conditions in the working environment of transport systems	12	2	2 2	6
1.6	Efficiency of the operator in information flows of transport systems and processes	12	2	2 2	6
1.7	Efficiency of ergatic transport systems and processes	12	2	2 2	6
1.8	Entropy and turbulence of ergatic transport systems and processes	13	2 1	2 2	6
1.9	Module Test №1	8	-	2	6
Total by the module №1		105	17	34	54
Total by the subject		105	17	34	54

3. BASIC CONCEPTS 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. Мадиевский Ю.М. Курс лекций по эргономике. Под ред. д-ра. техн. наук., проф. Березуцкого В.В. / Ю.М. Мадиевский. - Х.: НТУ «ХПИ», 2015. – 294 с.
- 3.2.2. Абракітов В. Е. Конспект лекцій з дисципліни «Ергономіка робочих місць» (для студентів 5 курсу денної та 6 курсу заочної форм навчання спеціальності 263 – Цивільна безпека) / В. Е. Абракітов, І. О. Ткаченко; Харків. нац. ун-т міськ. госп-ва ім. О. М. Бекетова. – Харків : ХНУМГ ім. О. М. Бекетова, 2017. – 78 с.

	Quality Management System. Course Training Program on «Ergonomic Provision of Transport Processes»	Document Code	QMS NAU CTP 19.01-01- 2021
		Page 7 of 9	

3.2.3. Севриков В.В. Оптимизация структур эргатических систем контроля и защиты пожаро взрывоопасных объектов / В.В. Севриков, Л.А. Ничкова, И.В Севриков. В.И.Швецова. – Изд. Лань, 2020. – 236 с.

3.2.4. Скрипець А.В. Інженерна психологія, ергономіка та людський чинник в авіації / А.В. Скрипець, О.Ю. Буров, В.В. Павлов. – К.: НАУ, 2011. – 400 с.

Additional Literature

3.2.5. Ергономіка та основи ергодизайну: методичні рекомендації до виконання курсової роботи / уклад. : Л.Р. Гнатюк, В.М. Заплатинський. – К.: НАУ, 2011. – 40 с.

3.2.6. Основы теории авиационных эргатических систем : учебное пособие / сост. В.С.Мехоношин. – Ульяновск : УВАУ ГА(И), 2011. – 75 с.

3.2.7. Методичні вказівки до проведення лабораторних занять та самостійної роботи з дисципліни «Ергономіка робочих місць» (для студентів 5 курсу денної та 6 курсу заочної форм навчання спеціальності 263 – Цивільна безпека) / Харків. нац. ун-т міськ. госп-ва ім. О. М. Бекетова; уклад.: В. Е. Абракітов, І. О. Ткаченко. – Харків : ХНУМГ ім. О. М. Бекетова, 2017. – 78 с.

3.2.8. Поплавська О. М. Ергономіка : Навч. посіб. / О. М. Поплавська; Київ. нац. екон. ун-т ім. В.Гетьмана. - К., 2006. - 317 с.

3.2.9. Veshneva I. Model of formation of the feedback channel within ergatic systems for monitoring of quality of processes of formation of personnel competences / Singatulin R, Bolshakov A., Tamara Chistyakova T., Melnikov L. // International Journal for Quality Research 9(3), 2015. – P. 495–512.

3.3. Internet Information resource

3.3.1 Official site of the International Ergonomic Association [Electronic resource]. - Access mode: <https://iea.cc/>

3.3.2. Official site of the State Aviation Service of Ukraine [Electronic resource]. - Access mode <https://avia.gov.ua/>

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
1 semester	
Module № 1 «Introduction into Major»	
Kind of Academic Work	Points
carrying out practicals and theoretical material (10p x 8)	80 (total)
<i>For admission to complete module test №1, a student must receive not less than</i>	<i>48 points</i>
Module test №1	20
Total by the module №1	100
Total by the subject	100

The credit rating is determined (in points and in a National Scale) based on the results of all types of academic work during the semester.

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

	Quality Management System. Course Training Program on «Ergonomic Provision of Transport Processes»	Document Code	QMS NAU CTP 19.01–01– 2021
		Page 8 of 9	

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.**

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

4.6. The final semester rating in points, on the national scale and the ECTS scale is entered in the test report, study card and individual curriculum of the student (record book), for example, as follows: **92 / Excellent / A, 87 / Good / B, 79 / Good / C, 68 / Sat./D, 65 / Sat./E, etc.**

4.7. 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

	Quality Management System. Course Training Program on «Ergonomic Provision of Transport Processes»	Document Code	QMS NAU CTP 19.01-01- 2021
		Page 9 of 9	

(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				