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Faculty of Transport, Management and Logistics  
Air Transportation Management Department

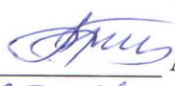
AGREED

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Quality Management System  
**COURSE TRAINING PROGRAM**  
on  
«Human Factor in Aviation»

Educational Professional Program: «Air Transportation Management»

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	1	105/3,5	17	—	34	54	—	—	Examinations

Index: CB-7-275-1/21-2.1.24

QMS NAU CTP 19.01–01–2021



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«Human Factor in Aviation»

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Course Training Program on «Human Factor in Aviation» is developed on the basis of Educational Professional Program «Air Transportation Management», Bachelor Curriculum and Bachelor Extended Curriculum № CB-7-275-1/21, № ECB-7-275-1 for Speciality 275 «Air Transport Technologies», Specialization 275.04 «Air Transport Technologies» and corresponding normative documents.

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## INTRODUCTION

Course Training Program on «Human Factor in Aviation» 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 disclosure of modern scientific concepts, methods and technologies in modern concepts of the human factor in air transport system.

The **tasks** of the subject are:


- theoretical knowledge about the characteristics and limitations of man as an object of research;
- the basics of the impact of human characteristics and limitations on flight safety;
- the impact of environmental and working characteristics on human performance;
- the impact of national and corporate culture, the level of training of crew members on flight safety;
- flight safety management system;
- methods of investigating aviation incidents and incidents and the role of the human factor in them.

#### – 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;
- Give answers, explain, understand explanations, discuss, report in the state language at a level sufficient for professional activity;
- Investigate the components of ergonomics of transport technologies. Establish their efficiency and reliability. Be able to use modern specialized software to solve typical engineering problems in the field of automation of transport systems and processes, in particular, mathematical modeling, computer-aided design, database management, computer graphics methods;
- Introduce methods of organizing safe transport activities;
- Investigate the human factor problems associated with transport, as well as the consequences of errors for safety and management. Identify patterns of human behavior in connection with mistakes.

#### – 1.3. Competences the subject makes it possible to acquire.

- Ability to exercise their rights and responsibilities as a member of society, to realize the values of civil (free democratic) society and the need for its sustainable development, the rule of law, human and civil rights and freedoms in Ukraine;
- Ability to preserve and increase moral, cultural, scientific values and achievements of society based on understanding the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, techniques and technologies, use different types and forms of physical activity for active recreation and healthy living;
- Ability to communicate in the state language both orally and in writing;
- Ability to communicate in a foreign language;
- Ability to assess and ensure the safety of transport activities;
- Ability to use modern information technologies, automated control systems and geographic information systems in the organization of the transportation process;
- Ability to critically analyze and solve practical problems in the field of air transport and related industries to ensure timely decisions, taking into account technical, regulatory, commercial, political, social and environmental constraints;

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- Ability to use professional knowledge and practical skills of technology, organization and management of air passenger traffic to solve engineering problems in production.

#### **1.4. Interdisciplinary connections.**

This subject is the basis for studying such subjects, as: «General Course of Transport», «Introduction into Major» and is basic for studying subjects, as: «Professional Foreign Language», «Health Care and Safety Management in Transport Industry».

## **2. COURSE TRAINING PROGRAM ON THE SUBJECT**

### **2.1. The subject content.**

Training material is structured according to module principle and consists of **one educational module, Module № 1 «The Impact of Human Factor in Aviation»**, that is 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 « The Impact of Human Factor in Aviation »**

#### **Integrated requirements to module №1:**

##### **know:**

- characteristics and limitations of man as an object of research;
- bases of influence of characteristics and restrictions of the person on flight safety;
- the impact of environmental and working characteristics on human performance;
- the impact of national and corporate culture, the level of training of crew members on flight safety;
- safety management system;
- methods of investigating aviation incidents and incidents and the role of the human factor in them.

##### **be able:**

- substantiate the methodological principles of the influence of the human factor in aviation;
- to form skills on development and maintenance of purposeful use of the personnel of the organization;
- determine the characteristics of the environment and the working environment for human performance;
- substantiate the national and corporate culture, the level of training of crew members for flight safety.
- take into account the human factor in transport technologies;
- analyze and solve practical problems in the field of air transport and related industries to ensure timely decisions, taking into account technical, regulatory, commercial, political, social and environmental constraints.


#### **Topic 1. Introduction. General provisions.**

Content and scientific basis of the subject, historical background and connection with other subjects. ICAO requirements. The structure and components of the educational process, the purpose and objectives of the discipline. Basic definitions. The need to take into account human factors. Events that can be attributed to human factors (human error). Classification of aviation events. Recommended Books.

#### **Topic 2. Models and methods of human factor research.**

National and corporate safety culture. Characteristics of different flight safety cultures. Types of personalities, characters and behavior.

SHEL model. Rizon's model. Murphy's Law. Observations, experiments, surveys, tests, sociometry, modeling, expertise and more.

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### **Topic 3. Psychological features of the person**

Communication. Material and written information. Basic principles of information exchange and communication in the team. Use of technical means for transmission and reception of information. Human memory. Types of memory, memory processes. Claustrophobia and physical distance.

Qualification requirements for professions. Handbook of qualification characteristics of workers' professions, issue 68 "Aviation transport".

### **Topic 4. "Fatigue" in aviation**

The impact of biological arrhythmias, insomnia and stress on the performance of aviation professionals. The effect of fatigue on performance. Causes of fatigue of crew members. Working capacity of air traffic controllers. Fatigue of maintenance personnel.

### **Topic 5. Human failures.**

Classification of factors influencing erroneous decisions. Measures to prevent human error. Causes of human error. Models and theories of erroneous actions. Consequences of errors in its avoidance and correction. Error prevention strategies. Voluntary notification system.

### **Topic 6. Flight safety management system.**

Risk management. Risk categories. Classification of aviation events. Special situations in flight and their consequences. The concept of an acceptable level of flight safety. Numerical values of risks.

Causes of air accidents due to crew errors. Measures to prevent aviation incidents.

The role of management in improving flight safety. Voluntary notification system.


### **Topic 7. Investigation of aviation accidents and incidents.**

Methods of investigating aviation accidents. The role of the human factor in the occurrence and aviation events. Disasters that changed aviation. Conclusions of the commission on prevention of aviation incidents.

### **Topic 8. Measures to increase the level of flight safety.**

ICAO Global Flight Safety Plan. State flight safety program. Flight security programs for airlines and airports. Measuring goals. The main measures to improve flight safety.



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### 2.3. Training schedule of the subject.

№	Theme (thematic section)	Total, hours			
		Total	Lectures	Labs	Self-study
1	2	3	4	5	6
<b>Module №1 «The Impact of Human Factor in Aviation»</b>					
		<b>1 semester</b>			
1.1	Introduction. General provisions	12	2	2 2	6
1.2	Models and methods of human factor research	12	2	2 2	6
1.3	Psychological features of the person	12	2	2 2	6
1.4	“Fatigue” in aviation	12	2	2 2	6
1.5	Human failures	12	2	2 2	6
1.6	Flight safety management system	12	2	2 2	6
1.7	Investigation of aviation accidents and incidents	12	2	2 2	6
1.8	Measures to increase the level of flight safety	13	2 1	2 2	6
1.9	Module Test №1	8	-	2	6
<b>Total by the module №1</b>		<b>105</b>	<b>17</b>	<b>34</b>	<b>54</b>
<b>Total by the subject</b>		<b>105</b>	<b>17</b>	<b>34</b>	<b>54</b>

### 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. Циркуляр ІКАО 240-AN 144. Людський фактор. Збірник матеріалів №7. Вивчення ролі людського фактору при авіаційних пригодах.

3.2.2. Циркуляр ІКАО 247- AN-148. Людський фактор. Збірник матеріалів №10. Людський фактор в управлінні та організації.

3.2.3. Doc 9756 Керівництво з розслідування авіаційних пригод та інцидентів Видання третє, 2020 ORGANIZACIÓN DE AVIACIÓN CIVIL INTERNACIONAL Doc XX

3.2.4. Повітряний кодекс України// Відомості Верховної Ради України, 2011, № 48-49, ст.536

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3.2.5. Положення про систему управління безпекою польотів /Наказ Міністерства транспорту №650 від 19.08.2003 р.

3.2.6. Про затвердження Авіаційних правил України "Порядок сповіщення про події в галузі цивільної авіації, розгляду отриманої інформації, її аналізу та вжиття відповідних заходів"//Наказ Державіаслужби від 27.12.2019 р. №1819

#### **Additional Literature**

3.2.7. Давиденко М.Ф. Людський фактор в забезпеченні безпеки польотів при експлуатації повітряних суден/Кременчуцький льотний коледж НАУ – 2019 -25 с.

3.2.8. Ударцева Т.Є. Працездатність авіаційних спеціалістів – Харків, Право, 2018-152 с.

3.2.9. Рева О.М. Людський фактор і безпека польотів/// Кіровоград -2018

#### **3.3. Internet Information resource**


3.3.1. <http://www.icao.int>

3.3.2. <https://www.un.org/ru/ecosoc/icao/>

3.3.3. <https://avia.gov.ua/>

3.3.4. <https://www.orap.ru/>



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#### 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
<b>1 semester</b>	
<b>Module №1 «The Impact of Human Factor in Aviation»</b>	
Carrying out Labs (76 x 8)	56 (сумарна)
<i>For admission to complete module test №1, a student must receive not less than</i>	<i>34 балие</i>
Module test №1	24
<b>Total by the module №1</b>	<b>80</b>
<b>Semester Examination</b>	<b>20</b>
<b>Total by the subject</b>	<b>100</b>


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

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(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 ознайо- млення	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				