

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

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 «06» 09 2023

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Quality Management System

COURSE TRAINING PROGRAM

on

«Air Transportation Engineering»

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:	2	120/4.0	18	—	18	84	CGP-2s	-	examination 2s

Index: CM-7-275-1/23-2.1.6


QMS NAU CTP 19.01–01–2023

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Course Training Program on «Air Transportation Engineering» is developed on the basis of the Educational Professional Program «Air Transportation Management», Master Curriculum and Extended Master Curriculum № CM -7-275-1/23, № ECM -7-275-1/23 for Speciality 275 «Transport Technologies», Specialization 275.04 «Air Transport Technologies» and corresponding normative documents.

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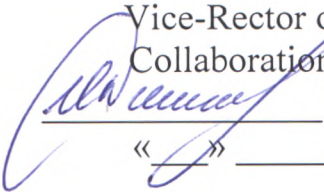
Discussed and approved by the Graduate Department for Speciality 275 «Air Transport Technologies», Specialization 275.04 «Air Transport Technologies» and Educational Professional Program «Air Transportation Management» - Air Transportation Management Department, Minutes № 17 of 05 09 2023.

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« » 2023

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INTRODUCTION

Course Training Program of the subject “Air Transportation Engineering” is developed based on the "Methodical guidance for the subject course training program", approved by the rector's order № 249/ОД, dated 29.04.2021 and corresponding normative documents.

1. EXPLANATORY NOTES

1.1. Place, aim, objectives of the subject

This training course is the theoretical basis of knowledge and skills for mastering technological subjects of specialists training in the field of transportation management and transport systems.

The purpose of teaching this subject is to form a system of scientific knowledge and practical skills of specialists in transport technology in the field of air transportation engineering.

The objectives of studying the discipline are:

- mastering the basic requirements of air transportation ground handling;
- mastering the main concepts, methods and approaches used in domestic and international practice during engineering support of air transportation;
- improvement of the airline logistical support.

1.2. Learning outcomes as results of mastering the discipline

PLO 03. Make effective decisions in the field of transport systems and technologies, in particular on air transport, taking into account technical, social, economic and legal aspects, generate and compare alternatives, assess the necessary resources and limitations, analyze risks.

PLO 05. To ensure the safety of people and the environment during professional activities and implementation of projects in the field of transport systems and technologies.


PLO 06. Develop new and improve existing transport systems and technologies, determine development goals, existing limitations, performance criteria and areas of use.

PLO 08. To develop cargo and passenger transportation technologies by modes of transport based on research and relevant data.

PLO 12. Manage complex technological and production processes of transport systems and technologies, in particular on air transport, including unpredictable and those that require new strategic approaches.

PLO 13. Organize the work of personnel, ensure their professional development and objective evaluation.

PLO 16. Research theoretical and experimental models for assessing the reliability and efficiency of transport technologies, in particular for air transport.

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1.3. Competences as results of mastering the discipline

IC The ability of a person to solve complex tasks and problems of the transport industry in the field of professional activity according to a certain type of transport systems and technologies and in the learning process, which involves conducting research and implementing innovations and is characterized by the uncertainty of conditions and requirements.

GC 05. Ability to develop projects and manage them.

GC 08. The ability to generate new ideas (creativity).

PC 01. The ability to research and manage the functioning of transport systems and technology.

PC 05. Ability to manage freight transportation by types of transport.

PC 06. Ability to manage passenger transportation by types of transport.

PC 08. The ability to manage the reliability and efficiency of transport systems and technologies, in particular in air transport.

PC 09. Ability to carry out examination of transport accidents by types of transport.

PC 12. The ability to use knowledge of the regulatory framework that determines the functioning of the air transport industry, the laws and principles of functioning of complex systems in combination with the necessary mathematical tools to describe the functioning and development of aviation transport technologies.

PC 13. The ability to formulate and analyze technological, technical, economic and financial problems in air transport, which can be related to both commercial practice and transport operations.

1.4. Interdisciplinary connections

This training course is based on knowledge from the following subjects: “Project Management in Transport Field”, “Management in Integrated Transport Systems” and is a base for mastering such subject as: “Major-related Training”, “Unified State Qualification Exam”, “Qualification work”.

2. ACADEMIC CURRICULUM OF THE SUBJECT


2.1. Content of the subject

Training material of the subject is structured according to a module principle and consists of one educational module, namely

- **educational module # 1 «Basic requirements to aircraft ground handling and management of material and technical provision of air transportation»**, which is logically complete, relatively independent, holistic part of the subject, learning of which provides module test and analysis of its implementation.

2.2. Modular structuring and integrated requirements for each module

Module № 1 «Basic requirements to aircraft ground handling and management of material and technical provision of air transportation»

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Integrated requirements to the Module №1:

Know:

- basic requirements to air transportation for ground handling; main conceptual definitions, methods and approaches, used in domestic and international practice during air transportation engineering support;

Learning outcomes:

- to improve the processes of airline logistics.

Topic 1. Basic requirements to air transportation ground handling management.

General provisions for ground handling of aircraft at the airport. Ground handling contracts. Access to the aircraft. Aircraft protection. Safety during working on the apron. Fire safety and protection on the apron. Technological schedules of aircraft maintenance at the airport.

Topic 2. Aircraft ground handling procedures. Communication with the aircraft crew. Towing the plane. Meeting and release of the aircraft. Aircraft parking. Providing the aircraft with ground power. Grounding the aircraft. Procedures for passengers boarding and disembarking. Operation of aircraft doors / holds. Aircraft water system maintenance. Maintenance of aircraft bathrooms. Aircraft refueling. Model of technological processes of ground handling and transportation at the airport

Topic 3. Peculiarities of aircraft maintenance and repair system designing. Factors that determine the content of aircraft maintenance and repair. The structure and basic principles of the system of aircraft maintenance and repair. Requirements for the system of aircraft maintenance and repair, and its place in the development of damage and failure. Conditions of the system of aircraft maintenance and repair functioning. Performance indicators of the system of aircraft maintenance and repair. Strategies for aircraft maintenance and repair.

Topic 4. Fundamentals of aircraft maintenance and repair system designing.


Features of modern aircraft maintenance and repair system designing. Ensuring the operational and technical characteristics of aircraft. Formation of a basic and flexible program of aircraft maintenance and repair. Formation of aircraft maintenance and repair modes.

Topic 5. Management of air transportation logistical support processes. Structure of the integrated procedure for supporting the logistics of air transportation. Technology of logistics processes at the airline. Engineering processes of air transportation logistics.

Topic 6. Logistical support of the processes of aircraft provision with spare parts. Modern technologies of integrated logistics support in civil aviation. Organization of the airline's logistics supply system. Delivery function in the airline. Planning and forecasting the needs of airlines logistics. Determining the optimal size of the order for aircraft spare parts. Planning and ensuring the technological process of the airline logistics system.

CALS-technologies in the system of logistics engineering of air transport. PDM system. PLM concept. The principle of parallel engineering. The principle of continuous improvement of business processes. Projects of CALS-technology implementation in aviation industry. Organization of the system of interaction between the equipment manufacturer and the operator with the help of CALS-technologies.

Topic 7. Usage of CALS technologies during Ground Support Equipment operation. Organizational and economic problems of CALS-technologies

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implementation in the aircraft construction complex of Ukraine. Organization of the integrated logistical support of aircraft operation and repair. Model for forecasting the economic efficiency of integrated logistics support for the operation and repair of aircraft. Analysis of the effectiveness of the implementation of integrated logistics support for the operation and repair of aircraft.


Stages of the aviation technics life cycle of and their characteristic duration. Cost of the aviation technics life cycle. The specific features of costs of developers and manufacturers of aviation technics. Specifics of costs at the stage of aviation technics operation. Structure of the aviation technics life cycle. CALS-technologies and problems of their implementation in the aircraft industry of Ukraine. Economic efficiency of CALS-technologies in the field of air transport.

Topic 8. Provision of ecological safety in civil aviation. Human factor in civil aviation.

ICAO Environmental Standards and Recommended Practices. Carbon Compensation and Reduction Scheme for International Aviation (CORSIA ICAO). Ukraine's participation in the CORSIA program. Aviation noise. ICAO policies and programs based on a "balanced approach" to the aviation noise management. Aviation rules of Ukraine "Requirements to the airfield operator regarding the spatial zoning of the territory around the airport taking into account aviation noise influence".

2.3. Structure of the subject

№	Theme	Total, hours			
		Total	Lectures	Labs	Self-study
1	2	3	4	5	6
2 semester					
Module №1 «Basic requirements to aircraft ground handling and management of material and technical provision of air transportation»					
1.1	Basic requirements to air transportation ground handling management.	12	2	2	8
1.2	Aircraft ground handling procedures	12	2	2	8
1.3	Peculiarities of aircraft maintenance and repair system designing	12	2	2	8
1.4	Fundamentals of aircraft maintenance and repair system designing	12	2	2	8
1.5	Management of air transportation logistical support processes.				
1.6	Logistical support of the processes of aircraft provision with spare parts. Modern technologies of integrated logistics support in civil aviation.	12	2	2	8
1.7	Usage of CALS technologies during Ground Support Equipment operation. Organizational and economic problems of CALS-technologies implementation in the aircraft construction complex of Ukraine.	12	2	2	8
1.8	Provision of ecological safety in civil aviation. Human factor in civil aviation.	15	2 2	2	9
1.9	Computing and Schematic Paper	10	-	-	10
1.10	Module Test №1	10	-	2	8
Total by the Module № 1		120	18	18	84
Total by the subject		120	18	18	84

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2.4. Computing and Schematic Paper

Computing and Schematic Paper (CSP) from the subject is carried out with the purpose to consolidate theoretical knowledge and practical skills of students, received during mastering educational material from the subject in the field of air transport, which will be used later during study of many subjects from the curriculum of professional training of specialists with basic and complete higher education.

The specific purpose of the task is to deepen the theoretical knowledge acquired by students in the process of studying the course and their application in the practical solution of the tasks.

Performance, execution and passing of the CSP is performed individually by each students in accordance with method guides.

Time necessary for CSP carrying out is 10 hours of self-studying.

2.5. List of questions to prepare for examination

The list of questions and the content of tasks to prepare for examination are developed by the leading lecturer of the department in accordance with the course training program, approved at the meeting of the department and announced to students.

3. BASIC CONCEPTS OF GUIDANCE ON THE SUBJECT

3.1. Teaching methods

During teaching the subject the following methods of learning are used:

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

Implementation of these methods is carried out during lectures, demonstrations, independent problems solution, work with educational literature, analysis and problem solving.

3.2. List of references

Basic literature:


3.2.1. IATA Airport Handling Manual, current edition. - Montreal-Geneva.

3.2.2. Експлуатація авіаційної техніки. Дмитрієв С.О., Тугарінов О.С., Докучаєв В.Г., Молодцов М.Ф. Навчальний посібник. Вид-во Нац. авіац. ун-ту «НАУ-друк», 2017. - 221 с.

3.2.3. Людський фактор в системі збереження льотної придатності авіаційної техніки: навч. посіб. / Бурлаков В.І., Пучков Ю.П., Попов О.В., Попов Д.В. - К. : НАУ, 2014. - 118 с

Additional literature:

3.2.4. Григорак М.Ю., Марчук В.Є., Косарєв О.Й., Калініченко В.І., Ремига Ю.С. Логістичний інжиніринг. Навчальний посібник. [Текст]/ М.Ю. Григорак, В.Є. Марчук та ін. - К.: НАУ, 2015. - 325 с.

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3.2.5. Taylor G.D. Logistics Engineering Handbook [Електронний ресурс]. - www.gbv.de/dms/ilmenau/toc/534350054.PDF.

3.2.6. Аксьонов І. М., Габа В. В., Шерепа К.М. Транспортна логістика: навчальний посібник - Київ: ДЕТУТ, 2015.

3.2.7. Марінцева. К. В. Наукові основи та методи забезпечення ефективного функціонування авіатранспортних систем [Текст]: монографія/ Марінцева К. В.. - Київ: НАУ, 2017. - 503 с.

3.3. Internet resources

3.3.1. <https://web.archive.org/web/20110402011307/http://users.rcn.com/hwbingham/tables/calstbhs.htm>

3.3.2. <http://cals.ru/sites/default/files/downloads/national/apl-to-s30001-intro.ppt>

3.3.3. <https://www.iata.org/publications/Documents/ahm37-toc-20161125.pdf>

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 “Basic requirements to aircraft ground handling and management of material and technical provision of air transportation”	
Carrying out labs (5px8)	40 (total)
Performance and defense of Computing and Schematic Paper	20
For admission to complete module test №1, a student must receive not less than	36 points
Module test №1	20
Total for the Module №1	80
Semester Examination	20
Total for 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 semester rating is converted into a grade on the national scale and the ECTS scale.

4.5. 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.**

4.6. The Total Grade for the subject is equal to the average grade from Total Semester Grades. 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 ознайомлення	Примітки

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(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				