


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

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AGREED

Dean of the Faculty of the Transport,
Management and Logistics


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«28» 09 2021

APPROVED

Vice-Rector for academics



Anatoli POLUKHIN
«7» 10 2021



Quality Management System
COURSE TRAINING PROGRAM
on
«Air Transportation Engineering»

Educational and 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-7-275-1/21-2.1.6

QMS NAU CTP 19.01-01-2021



Course Training Program on «Air Transportation Engineering» is developed on the basis of the Educational and Professional Program «Air Transportation Management», Master Curriculum and Extended Master Curriculum №CM-7-275-1/21, №ECM-7-275-1/21 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 № 15 of «31» 08 2021.

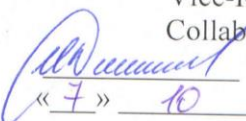
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«7» 10 2021

	Quality Management System. Course Training Program on «Air Transportation Engineering»	Document Code	QMS NAU CTP 19.01-01-2021
		page 3 of 9	

CONTENTS

Introduction	4
1. Explanatory notes	4
1.1. Place, aim, objectives of the subject	4
1.2. Results of mastering the training course	4
1.3. Competencies of mastering the training course	4
1.4. Interdisciplinary connections	5
2. Academic curriculum of the subject	5
2.1. Content of the subject	5
2.2. Modular structuring and integrated requirements for each module	5
2.3. Structure of the subject.....	6
2.4. Computing and Schematic Paper.....	7
2.5. List of questions to prepare for examination.....	7
3. Basic concepts of guidance on the subject	7
3.1. Teaching methods.....	7
3.2. List of references (basic and additional)	7
3.3. Internet resources	8
4. Rating system of knowledge and skills assessment	8

	Quality Management System. Course Training Program on «Air Transportation Engineering»	Document Code	QMS NAU CTP 19.01-01-2021
		page 4 of 9	

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. Results of mastering the training course

- to develop technologies of cargo and passenger transportation by different types of transport on the basis of researches and relevant data;
- to investigate theoretical and experimental models for assessing the reliability and efficiency of transport technologies by the mode of transport;
- to apply problem-oriented methods of analysis, synthesis and optimization of computer-integrated information management systems for air transport complexes;
- to present the results of research activities, to prepare scientific publications, to participate in scientific discussions at scientific conferences, symposia as well as carry out pedagogical activities in educational institutions.

1.3. Competencies of mastering the training course

- ability to search, process and analyze information from various sources;
- ability to develop and manage projects;
- ability to conduct research at the appropriate level;
- ability to conduct research within a narrow specialization, identify problems, set goals and solve them using appropriate research methods;
- ability to investigate and manage the operation of transport systems and technologies;
- ability to determination and application of perspective areas of transport processes modeling;
- ability to manage traffic flows;
- ability to use knowledge of the regulations, determining functioning of the air transport industry, laws and principles of complicated systems operation in combination with necessary mathematical tools to describe the functioning and development of air transport technologies.

	Quality Management System. Course Training Program on «Air Transportation Engineering»	Document Code	QMS NAU CTP 19.01-01-2021
		page 5 of 9	

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»

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

	Quality Management System. Course Training Program on «Air Transportation Engineering»	Document Code	QMS NAU CTP 19.01-01-2021
		page 6 of 9	

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 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

	Quality Management System. Course Training Program on «Air Transportation Engineering»	Document Code	QMS NAU СТР 19.01-01-2021
		page 7 of 9	

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., Косарев 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.

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-s3000l-intro.ppt>

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

	Quality Management System. Course Training Program on «Air Transportation Engineering»	Document Code	QMS NAU CTP 19.01-01-2021
		page 8 of 9	

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

(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 введення зміни
	Зміненого	Заміненого	Нового	Анульованого			

(Ф 03.02 – 32)

УЗГОДЖЕННЯ ЗМІН

	Підпис	Ініціали, прізвище	Посада	Дата
Розробник				
Узгоджено				
Узгоджено				
Узгоджено				