

NATIONAL AVIATION UNIVERSITY
Educational and Research Airspace Institute
Engineering Department

AGREED

Acting Director of the Educational
and Research Airspace Institute

_____ S. Dmytriev
«__» _____ 2017

APPROVED

Vice-Rector for Academics
and Educative Activity

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«__» _____ 2017



Quality Management System
COURSE TRAINING PROGRAM
on
«Materials Science»

Field of study: 27 «Transport»
Specialty: 272 «Aviation Transport»
Speciality: «Maintenance and Repair of Aircraft and Aircraft Engines»
«Airports Technologies of Works and Technological Equipment»

Year of study – 2

Lectures – 17

Laboratory Classes – 17

Student's self-study hours – 56

Total (hours/ECTS credits) – 90/3

Homework – 1 (3 semester)

Semester– 3

Graded Test – 3th semester

Index ECB 1–272/16-2.10

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Quality Management System
Course Training Program
on
"Materials Science"

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The Course Training Program on «Materials Science» is based on the Bachelor Extended Curriculums № ECB-1-272/16 for Specialty 272 «Aviation Transport», Specialization «Airports Technologies of Works and Technological Equipment», Specialization «Maintenance and Repair of Aircraft and Aircraft Engines», Syllabus of this Subject, Index CB1 – 1–272/16-2.10, approved by Rector __._____.2017, and correspondent normative documents.

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1. INTRODUCTION

The Course Training Program of Discipline "Theory of Machines and Mechanisms" is developed on the basis of "the guidelines for the development and execution of training programs and work training courses", enacted by order 16.06.2015y. №37 / poz.

The rating grading system (RGS) is an integral part of working curriculum and involves determining the quality of a student performed all types of classroom and independent academic work and his level of acquired knowledge and skills evaluation in grades by the results of this work in the current, module and semester control, with subsequent transfer by multi-scale assessment to assess the national scale and scale ECTS.

(RGS) provides for the use of modular of ratings (current, control, final) and the examination or a test, the final semester and the final rating.

2. SUBJECT CONTENT

2.1. Training schedule of the subject

№	Topics	Volume of classes (hours)			
		Total	Lectures	Lab. works	Total
1	2	3	4	5	6
3 semester					
Module №1 «Materials Science»					
1.1	Structure and properties of solids	9	2	2	5
1.2	Elements of alloy theory	9	2	2	5
1.3	Iron-Carbon phase diagram	9	2	2	5
1.4	Heat treatment of metals and alloys	9	2	2	5
1.5	Materials surface hardening technologies	9	2	2	5
1.6	Alloy steels and alloys	9	2	2	5
1.7	Alloys based on non-ferrous metals	9	2	2	5
1.8	Aircraft composite materials. Aircraft fabrics and wood	10	2	2	6
1.9	Corrosion of metals	4	1	–	3
1.10	Homework	8	–	–	8
1.11	Module test №1	5	–	1	4
Total for module №1		90	17	17	56
Total for the discipline		90	17	17	56

2.1.1. Homework

The homework is carried out in the fifth semester, in accordance with the approved methodological recommendations, in order to consolidate and deepen the students' theoretical knowledge and skills, and is an important step in mastering the teaching material that is taught in the third semester.

The specific goal of homework is contained in the study and mastering of modern composite and nanomaterials, their characteristics and application in aerospace engineering designs.

The execution, registration and protection of a homework is carried out by the student individually in accordance with the methodical guide.

The volume for homework carrying out is 8 hours.



3. BASIC CONCEPTS OF GUIDANCE ON THE SUBJECT

3.1 List of references

Basic recommended literature

3.1.1. S.L. Kakani, Amit Kakani. Materials science. - New Age International (P) Ltd., Publishers, 2004. – 640p.

3.1.2. Пахолюк А.П., Пахолюк О.А. Основи матеріалознавство і конструкційні матеріали. – Львів: Світ, 2005 – 172с.

3.1.3. Абраимов Н.В., Елисеєв Ю.С, Кримов В.В. Авиационное материаловедение и технология обработки материалов. Учебное пособие для авиационных вузов.–М.:Высш.шк., 1988.-444с.,ил.

3.1.4. Лахтин Ю.М., Леонтьева В.П. Материаловедение.-М.: Машиностроение. 1990 – 528с.

3.1.5. Лабунец В.Ф.Авиационные конструкционные материалы с высокой удельной прочностью:Учебное пособие.-Киев:КМУГА,1993.-116с.

3.1.6. Дубинин Г.Н., Тананов А.И. – Авиационное материаловедение.Учебник для высших учебных заведений гражданской авиации. М.: Машиностроение,1988.-320с.:ил.

Additional recommended sources.

3.1.7. Шварц В.В. Иллюстрированный словарь по машиностроению (англо- немецко- франц- испанско-русский) -М.: Рус.яз.,-428с.


3.1.8. Назаренко П.В. Авиационное материаловедение. Неметаллические материалы. – Киев: РИО КМУГА, 1984 – 96с.

3.1.9 Алюминиевые сплавы «Состав, свойства, технология, применение» Справочник/В.М.Белецкий,Г.А.Кривов.-К.: «КОМИНТЕХ», 2005. – 365 с.

3.1.10 Я.А. Криль, Г.В. Криль, Флюнт О.Р. Матеріалознавство Російсько-українсько-англій-ський словник 2010

3.2. List of basic guidance materials for the subject.

№ пор .	Name	Index of topics where guides are used	Amount
1.	Methodical complex of the discipline “Materials science”	1.1-1.9	1
2.	Table “Metallography”	1.1	1
3.	Table “Iron-carbon alloys”	1.3	1
4.	Table “Heat treatment of stels”	1.4	1
5.	Table “Alloy steel”	1.6	1
6.	Table “Titanium alloy”	1.7	1
7.	Table “Alluminium alloys”	1.7	1

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8.	Table "Copper alloys"	1.7	1
9.	Table "Paints"	1.8	1
10.	Microscopic sections of carbon and alloy steels, nickel-, titanium-, aluminum-, copper-based alloys	1.1-1.7	40
11.	The specimens of structural and special plastics and composite materials	1.8	40
12.	Aircraft components damaged by corrosion	1.9	15

4. RATING SYSTEM OF KNOWLEDGE AND SKILLS ASSESSMENT

4.2. Grading Scale for Students' Learning Outcomes Assessment

4.2.1. Grading of different kinds of academic work performed by a student is done in accordance with Table 4.1.

Table 4.1.

Grading of different kinds of a student's academic work

3 semester		
Module №1		Max grade
Kind of Academic Work	Max grade	
Performance and Defense of Laboratory works № 1.1-1.8 (8×6 v)	48	
Performance and Defense of Homework	10	
<i>For carrying out module test № 1, a student must receive not less than 38 values</i>		
Module test №1	30	
Graded test		12
Total for the discipline		100

4.2. The kind of academic work, performed by a student, has been passed, if a student got positive grade according to National Scale. (table 4.2).


Table 4.2

Correspondence between Grade values and the National System

Grade values			National Scale
Carrying out and defense of lab. work	Carrying out and defense of homework	Carrying out of module test.	
6	9-10	27-30	Excellent
5	8	23-26	Good
4	6-7	18-22	Satisfactory
under 4	under 6	under 18	Bad

4.3. The grades a student has been given for the different kinds of academic work the summed up and the result constituting a Current Module Grade is entered into the Module Grade Register.

4.4. Students have their module test №1 and №2 in a written form. The procedure, which lasts up to two academic hours, is held by a commission headed by the head of the department responsible for the

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discipline. The correspondence between Module Test Grade values and the National Scale is shown in Table 4.3.

4.5. The Semester Module Grade is calculated as the sum of the Total Module Grades. The correspondence between Semester Module Grade values and the National Scale is given in Table 4.4, 4.5.

Table 4.3

Correspondence between Total Module Grade values and the National Scale

Module №1	National Scale
79-88	Excellent
66-78	Good
53-65	Satisfactory
Under 53	Bad

Table 4.4.

Correspondence between Semester Module Grade Values and the National Scale

Semester Grade Values	National Scale
79-88	excellent
66-78	good
53-65	Satisfactory
under 53	Bad

Table 4.5

Correspondence between Graded Test Grade Values and the National Scale

Semester Grade Values		National Scale
Gr. Test	Exam.	
12	11-12	Excellent
10	9-10	Good
8	7-8	Satisfactory
-	Under7	Bad

4.6. The Total Semester Grade in a Semester with a graded Test at its end is equal to the sum of the Semester Module Grade and the Minimal Graded Test established for each category of Semester Module Grades (**12 for „Excellent“, 10 for „Good“, 8 for „Satisfactory“**)

4.7. A student is not allowed to increase his/her positive Total Semester Grade by taking a repetitive test.

4.8. The Semester Module Grade and Graded test make up a Total Semester Grade whose correspondence to the National Scale and ECTS Scale is shown in Table 4.6.

Table 4.6

Correspondence of Total Semester Grades to the National Scale and the ECTS Scale

Total Semester Grade Values	National Scale	ECTS Scale	
		Grade	Explanation
90-100	Excellent	A	Excellent (excellent performance with insignificant shortcomings)
82 – 89		B	Very Good (performance above the average standard with a few mistakes)
75 – 81	Good	C	Good (good performance altogether with a certain number of significant mistakes)
67 – 74		D	Satisfactory (performance meets the average standards)
60 – 66	Satisfactory	E	Sufficient (performance meets the minimal criteria)
35 – 59		FX	Bad (bad performance; a second testing is required)
1 – 34	Bad	F	Bad (very bad performance; a student shall retake the course)

4.9. The Total Semester Grade is entered into a student's record book, for example: **92/Ex/A, 87/Good/B, 79/Good/C, 68/Sat/D, 65/Sat./E**, etc.

The above final grade of discipline entered in the Diploma Supplement.



(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				