(Ф 03.02 – 92)

NATIONAL AVIATION UNIVERSITY
Educational and Research Institute of Airports
Computer Technologies of Design and Graphics Department

AGREED
Director of the Educational and
Research Aerospace Institute
_____ V. Shmarov
«___»_____2016.

APPROVED
Vice-Rector for Academics
and Educative Activity
_____ T.Ivanova
«12» 12. 2016.

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Quality Management System

COURSE TRAINING PROGRAM
on
«Descriptive Geometry»

Field of Study: 13 «Mechanical Engineering»
Speciality: 134 «Aviation and Space Rocket Technology»
Specializations: «Airplanes and Helicopters»
«Aircraft Equipment»

Year of Study – 1st Semester – 1st

Lectures – 34
Laboratory classes – 17 Graded Test – 1st semester
Self-study – 39
Total (hours/ECTS credits) – 90/3,0
Homework (1) – 1st semester

Index ECB -1-134/16-2.1.4

QMS NAU CTP 14.01.06-01-2016

The Course Training Program on «Descriptive Geometry» is based on the Bachelor Extended Curriculum № ECB -1-134/16 for Speciality 134 «Aviation and Space Rocket Technology» and Specializations: «Airplanes and Helicopters», «Aircraft Equipment», Syllabus for this Subject, Index CB -1-134/16-2.1.4 approved by the Rector «12» 12 2016 and correspondent normative documents.

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_____ V. Kazak
«___» _____2016

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1.INTRODUCTION

The Course Training Program on «Descriptive Geometry» is developed on the basis of Bachelor Extended Curriculum and "Methodical instructions for development and issuance of syllabus and course training programs of the subjects" enacted by order as of 16.06.2015 №37/роз.

Rating system assessment (RSA) is an integral part of Course Training Program and involves determining the quality of a student performed all kinds of classroom and self- study of work and acquired his knowledge and skills through assessment in scores results of this work in the current, modular and semester control followed by multi-transfer assessment scale to according the national scale and scale ECTS.

RSA provides use of modular Grades (Current, Control, Total) as well as Examination or a Graded Test, the Total Semester and Total Grades.

2. SUBJECT CONTENT

2.1. Training schedule of the subject

№	Topic	Academic Hours			
		All	Lectures	Laboratory classes	Self-study
1	2	3	4	5	6
1 Semester					
Module №1 "Basis of geometric modelling"					
1.1	Introduction. Method of projections	8	2	2	4
1.2	Orthogonal projections of basic elements of geometrical space	16	2 2 2	2 - 2	2 2 2
1.3	Methods of transformation orthogonal drawings	10	2 2	2 -	3 1
1.4	Homework (part 1)	4	-	-	4
1.5	Module test №1	3	2	-	1
Total for the module №1		**41**	**14**	**8**	**19**
Module №2 "Modelling of space objects"					
2.1	Polyhedrons	6	2	2	2
2.2	Curved lines	7	2	2	3
2.3	Curved surfaces	23	2 2 2 2 2	2 - - 2 1	2 1 1 2 2
2.4	Axonometric projections of geometric bodies	6	2 2	- -	1 1
2.5	Homework (part 2)	4	-	-	4
2.6	Module test №2	3	2	-	1
Total for the module №2		**49**	**20**	**9**	**20**
Total for the1st semester		**90**	**34**	**17**	**39**
Total for the discipline		**90**	**34**	**17**	**39**

2.1.1. Homework

Homework (HW0 is executed in the first semester, in accordance with the ratified methodical recommendations with the purpose of fixing and deepening of theoretical knowledge and abilities of students and is the important stage in mastering of educational material.

Homework is executed on the base of educational material given to Self-study students and is a component of the module № 1 "Basis of geometric modelling " (part №1) and module № 2 “Modelling of space objects” (part №2).

The specific purpose of homework is contained, depending on the version, the learning and mastering the method of projections defining characteristics of sets of points geometric space, points, lines, planes on the example of the design elements of the design of the aircraft. The problems of geometric modeling polyhedrons, curves and surfaces in orthogonal and axonometric projections are consider.

Implementation, registration and defense of HW is carried out by a student in an individual order in accordance with methodical recommendations.

The time required for implementation each of HW - up to 8 hours of Self- study

3. BASIC CONCEPTS OF GUIDANCE ON THE SUBJECT

3.1. List of references

Basic literature

3.1.1. *Михайленко В.Є.* Нарисна геометрія: підручник / В.Є. Михайленко, М.Ф. Євстигнєєв, С.М. Ковальов. За ред. В.Є. Михайленка. 3-тє вид., переробл. – К.: Видавничий дім «Слово». 2013. – 304 с.

3.1.2. *Ковальов Ю.М.* Прикладна геометрія: підручник / Ю.М. Ковальов, В.М. Верещага. – К.: Дія. 2012. – 472 с.

3.1.3. *Хмеленко О.С.* Нарисна геометрія: підручник. / О.С. Хмеленко – К.; Кондор, 2008. – 440 с.

3.1.4. *Гордон В.О.* Сборник задач по курсу начертательной геометри: учебное пособие / В.О. Гордон, Ю.Б. Иванов, Т.Е. Солнцева. 7-е изд. –М.: Высшая шк. 1988.– 320 с.

3.1.5 *Макаренко М.Г* Нарисна геометрія: методичні рекомендації до виконання розрахунково-графічних робіт / уклад.: М.Г. Макаренко, В.І. Макаров, В.П. Юрчук. –К.: НАУ, 2013. – 60 с.

3.1.6. *Ковальов Ю.М.* Нарисна геометрія. Завдання для практичних занять та самостійної роботи: практикум / уклад.: Ю.М. Ковальов, М.В. Терехова, М.Г. Макаренко [та ін.] 2-ге вид. –К.: НАУ, 2014. – 64 с.

Additional literature

3.1.7. *Ковальов Ю.М.* Основи геометричного моделювання: навч. посіб. / Ю.М. Ковальов – К.: Вища шк. 2003. – 232 с.

3.1.8. *Макаров В.І.* Нарисна геометрія. Інженерна та комп’ютерна графіка: навч. посіб. / В.І. Макаров, В.Г. Шевченко, М.Г. Макаренко та ін.. – К.: Книжкове вид-во НАУ, 2006, 259 с.

3.1.9. *Гордон В.О* Курс начертательной геометри: Учебное пособие / Под ред. Гордона В.О., Иванова Ю.Б. 24-е изд. –М.: Высшая шк. 2000. – 271 с.

3.2. List of basic guidance materials for the subject

№	Name	Index of Topics where Guides are Used	Amount
1.	Multimedia course	1.1 –1.3, 2.1 – 2.4	Electronic version
2.	Methodological guidance for implementation of homework	1.4, 2.5	Edition 100 copies and electronic versions
3.	Practicum for implementation of laboratory works	1.1 –1.4, 2.1 – 2.4	Edition 300 copies and electronic version

4. RATING SYSTEM OF KNOWLEDGE AND SKILLS ASSESSMENT

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

Table 4.1.

1 semester				
Module №1		Module №1		Max Grade
Kind of Academic Activities	Max Grade	Kind of Academic Activities	Max Grade	
Performance and deference of laboratory classes № 1.1 – 1.4	16 (summarily)	Performance and deference of laboratory classes № 2.1 – 2.5	20 (summarily)	
Performance and deference of Homework (part №1)	10	Performance and deference of Homework (part №2)	12	
For carring out module test №1, a student must receive not less than 16 values		*For carring out module test №2, a student must receive not less than 19 values*		
Carrying out Module Test №1	15	Carrying out Module Test №2	15	
Total for module №1	**41**	**Total for module №2**	**47**	
Semester Graded Test				**12**
Total 1st Semester Grade				**100**

4.2. The completed curricular activity is accounted if the student received a positive mark (Table 4.2).

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

Table 4.2

Correspondence between the Grades and the National Scale

Grades					National scale
Performance and deference of laboratory classes		Performance and deference of Homework		Carrying out Module Test	
		Part №1	Part №2		
15 – 16	18 – 20	9-10	11 – 12	14 – 15	Excellent
12 – 14	15 – 17	8	9 – 10	11 – 13	Good
10 – 11	12 – 14	6 – 7	7 – 8	9 – 10	Satisfactory
under 10	under 12	under 6	under 7	under 9	Bad

4.4. The Current Module Grade and the Module Test Grade together make up a Total Module Grade(Table 4.3), whose correspondence to the National Scale is entered into the Module Grade Register.

Table 4.2

Correspondence between the Total Module Grades and the National Scale

Module №1	Module №2	National Scale
37-41	42-47	Excellent
31-36	35-41	Good
25-30	28-34	Satisfactory
under 25	under 28	Bad

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. Table 4.4 Table 4.5

Correspondence between the Semester Module Grades and the National Scale

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Grades	National Scale
79-88	Excellent
66-78	Good
53-65	Satisfactory
under 53	Bad

Correspondence between the Graded Test Grades and the National Scale

National Scale	
Graded Test	
12	Excellent
10	Good
8	Satisfactory
-	-

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

Table 4.6

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

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

4.7. The Total Semester Grade is entered into the Examination Register, educational card and into a student's record book in according to National Scale and ECTS Scale.

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

4.9. The Total Grade of the discipline, that is taught during the one semester, is equal to the Total Semester Grade.

The Total Grade of the discipline is entered to the Appendix of Diploma.

(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	Дата внесення зміни	Дата введення зміни
	Зміненого	Заміненого	Нового	Анульо-ваного			

(Ф 03.02 – 32)

УЗГОДЖЕННЯ ЗМІН

	Підпис	Ініціали, прізвище	Посада	Дата
Розробник				
Узгоджено				
Узгоджено				
Узгоджено				