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**TEACHING OF DISCIPLINE «COMPUTER GRAPHICS» IN
THE PROFESSIONAL TRAINING OF SPECIALISTS OF
COMPUTER SCIENCES**

O.T.Bashta, O.V.Dzhuryk, U.U.Grischenko, N.O.Girnyk
Ukraine, Kyiv, National Aviation University
Ukraine, Kyiv, company «Una»
djudi@inbox.ru

The training of students of Aviation Control Systems Faculty of National Aviation University is produced in English in separate groups.

The purpose of study of the discipline “Computer graphics” is to give knowledge to students of bases of computer graphics (structure computer graphics, graphic algorithm, mathematical bases of geometrical modeling, simple receptions of designing geometrical forms, bases of construction of realistic images, use of graphic editor AutoCAD for construction of drawings) and computer graphic - information technologies.

The main tasks to deliver the discipline is creations of students' complete representation concerning computer graphics as uniting technical, mathematical, linguistic and program compounds, mastering of methods of its using at different design stages of details and complex products, skill to select the most suitable for the decision of specific problems tool software and computer technologies, finding practical skills and habits which will be used during future professional work.

The Discipline “Computer Graphics” belongs to fundamental disciplines which make the basis of the general engineering formation and establishes communications between fundamental and professional – guided disciplines in which graphic or text documents are used.

Teaching the discipline forms habits and skill of doing and reading drawings in accordance with requirements of the state and international standards.

Computer graphics studies the manipulation of visual and geometric information using computational techniques and it is based on the next fundamental disciplines: higher mathematics, engineering drawing, computer facilities, computer networks, algorithmic languages, theory of information.

Main stages of formation of the images:

- modeling – process of applying of methods of mathematical describing of objects and scenes, namely geometrical figures and bodies, rocks, trees, clouds, cars and other objects in two and three dimensional space;
- visualization – process of formation of static of dynamical realistic images of the screen of computer with special effects.

Synthesized computer image will look like real one only while perfect methods of modeling of geometrical forms and means of visualization. Thus, computer graphics can be considered as an art of creation of realistic illusion of the real world. This side of its application is more widely used in virtual reality systems, which are complexes of device and program means of imitation of environment with help of visual acoustic, haptic and other effects.

On the other side, by means of computer synthesis, creation of unreal, fantastic images and effects became possible. With help of computer graphics, advertising business became implementation of animated images.

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Branches of using of computer graphics include:

- systems of automatic projecting , in which interactive cooperation of designer and synthesized image of product of building being under creation is carried out;
- automatic systems of science researches , in which visualization of results of experiments as three-dimensional static or dynamic images is carried out;
- identification and processing of images in systems of artificial vision, aviation and space mapping (cartography), medical tomography and others. Scanned image, space photos, location data and other may be initial material.

Because of the above mentioned, aim and task of discipline “Computer graphics” is studying in systematized form and active studying of main methods of geometrical modeling of objects and visualization of images; studying of modern graphical packages of training and visualization of computer images by students. Discipline has practical direction related to creation of software for interactive modeling

of geometrical objects in two and three dimensions and for visualization of three-dimensional scenes For the perfect learning of material from discipline “Computer graphics” it is proposed to distribute educational time of 108 hours.

Distribution of educational time of module № 1 is shown in the next table.

Topical plan of the discipline

№	Topics	Amount of required time, hours			
		Total	Lectures	Lab	Self stud
1	2	3	4	5	6
<i>Module № 1. Bases of computer graphics. Raster and vector schedule. Geometrical modeling (space, objects). Carrying out simple drawings in the graphical editor AUTOCAD</i>					
1.	1 Hardware and program means of computer graphics (CG). Computer ecology. Rules of safe job with a computer. Raster and vector graphics. Systems of colors in CG. Formats of graphic files. Scanning raster images. Converting raster images. Graphical editor AutoCAD: start, concept about adjustment of parameters of a working environment, the basic operating modes and commands of Draw and Edit. Task “Construction of the drawing of a flat detail”.	9	2	4	3

2.	<p>Geometrical modeling three-dimensional space. Modes of object snap. Dimensioning distances in AutoCAD. Computer simulator “Multiview drawing of a point”. Computer descriptive geometry: the decision of metric and positional problems. Mathematical modeling geometrical objects. Development of geometrical model of flat linear image. Analytical and algorithmic formalization. Development and step-by-step presentation of graphic algorithm of flat linear image construction. Construction of a symbolic image in the environment of the raster graphic editor.</p>	15	4	6	5
3.	<p>Development of complex multi component documents. Insert of graphic images into complex document. Creation of a visiting card and its polygraph breadboard. Vector graphics. Use of libraries of graphic elements. Development of an algorithm block diagram in the environment of the vector graphic editor</p>	9	2	4	3
4.	<p>AutoCAD. Adjustment of parameters of a working environment. Development of the templates of drawing (by layers) the formats A4 and A3. Technology of development of drawing of a detail such as “Flat contour”. Print. AutoCAD command files. Development of the flat linear image construction script. Construction fillets by means of AutoCAD. Development of the flat contour drawing with conjugations.</p>	21	2	12	7

5.	Module Test № 1	3		2	1
		57	10	28	19
Total Module Grade 1					

The syllabus of each discipline is a must for successful teaching process organization according to the European Credit Transfer System. Teachers and students are to be familiarized with it. Grading system is an integral part of the syllabus and provides the assessment of student's knowledge and skills during current, module and semester checks.

Grading procedure is performed according to the national grading scale and European Credit Transfer System grading scale.