

Discipline	COMPUTER GRAPHICS AND VISUALIZATION code: 27 winter semester		
Specialty	Computer Systems and Technologies		
ECTS credits: 6	Form of assessment: exam		
Lecturer	Assoc. Prof. Mariana Stoeva, PhD Room 310 TB Phone: +359 52 383 616 E-mail: mariana_stoeva@tu-varna.bg		
Department	Software and Internet Technologies		
Faculty	Faculty of Computing and Automation		
<p>Learning objectives:</p> <p>The aim of the course is to introduce students to the basic methods of computer graphics and visualization necessary for the construction of different types of graphic systems (GC). Different aspects of graphical applications are discussed as a set of software, hardware, data, manipulation, storage, analysis and visual representation of data in systems with different application areas. The course includes lectures on topics such as the mathematical foundations of computer vision, models, types and specifics of graphical systems. Mathematical tools needed to represent the geometric aspects of graphical objects, especially for modeling of smooth shapes and surfaces, have been specially studied. The themes of computer modeling of light, colors, exposure, reproduction, and composition of the frame, as well as the ways of storing graphic data are discussed. Attention is paid to the methods and means of storing graphic data. Algorithms for visualization of two-dimensional and three-dimensional graphic objects, business, technological and management, geographic and other graphic systems are also explored. The content includes questions about the synthesis of realistic images, the movement of graphics objects, animation systems, and the creation of virtual reality. The course also envisages the development of different types of graphics systems in the OpenGL graphics environment.</p>			
CONTENTS:			
	Training Area	Hours lectures	Hours seminar exercises
	Graphic program libraries	2	2
	Raster graphics. Two-dimensional graphics	2	2
	Business graphics	2	2
	Algorithms for plotting graphic primitives (segment, circle, etc.).	2	2
	Algorithms for two-dimensional cutting and filling closed areas.	2	2
	Transformations of graphic objects	3	3

Three-dimensional graphics. Design transformations	3	3
Algorithms to remove hidden lines	2	2
Coloring 3D objects with realistic color	2	2
TOTAL: 60 h	30	30