1.	Course Title	Computer graphics
2.	Code	F18L2S114
3.	Study program	Software engineering and information systems
4.	Study Program Organizer	Faculty of Computer Science and Engineering
5.	Degree (first, second, third cycle)	first cycle
6.	Academic year / semester 2 / summer / mandatory	7. ECTS credits 6
8.	Teacher	full professor Suzana Loshkovska
9.	Course enrollment prerequisites	Објектно-ориентирано програмирање и (Дискретна математика или Дискретни структури 2)
10.	Course program goals (competencies): The purpose of the course is to familiarize students with theoretical fundamentals and concepts of 2D and 3D computer graphics, geometric modeling, transformations, rendering and generating curves and surfaces using splines. The practical implementation of the algorithms will be realized by OpenGL. Upon finishing of the course, the student is expected to demonstrate knowledge of the theoretical fundamentals and concepts of 2D and 3D computer graphics, use OpenGL library and graphic software packages for practical implementation of computer graphics problems.	
11.	Course program content: Introduction. Terminology. Application. Graphics devices. Software. Graphic primitives. Coordinate systems. Representation, attributes and implementation of graphic primitives. 2D transformations, homogeneous coordinates. Graphics pipeline. Clipping. Splines, curve representation, cubic splines, Hermite's splines, Bezier's curves, geometric algorithm for drawing splines. 3D transformations, 3D view. 3D graphics pipeline, projections, 3D clipping. Illumination models, light sources, surface effects, reflection, transparency. Algorithms and techniques for polygons rendering. Ray tracing. Textures, definition, types of textures, texture mapping.	
12.	Learning methods: Lectures using presentations, interactive lectures, exercises (using equipment and software packages), teamwork, case studies, invited guest lecturers, independent preparation and defense of a project assignment and seminar work.	
13.	Total available time	6 ECTS x 25 hours = 150 hours

14.	Distribution of the available time		30 + 45 + 15 + 15 + 75 = 180 hours	
15.	Teaching activity forms	15.1.	Lectures – theoretical teaching	30 hours
		15.2.	Exercises (laboratory, auditory), seminar papers, teamwork	45 hours
16.	Other activity forms	16.1.	Project Tasks	15 hours
		16.2.	Independent Learning Tasks	15 hours
		16.3.	Home learning	75 hours
17.	Assessment methodology			
	17.1.	Tests		20 points
	17.2.	Seminar paper/project (presentation: written and oral)		0 points
	17.3.	Activity and learning		10 points
	17.4.	Final exam		70 points
18.	Assessment criteria (points/grade)	up to 50 points	5 (five) (F)	
		51 to 60 points	6 (six) (E)	
		61 to 70 points	7 (seven) (D)	
		71 to 80 points	8 (eight) (C)	
		81 to 90 points	9 (nine) (B)	
		91 to 100 points	10 (ten) (A)	
19.	Course completion and final exam requirements	Realized activities 15.1 and 15.2		
20.	Teaching Language	Macedonian and English		
21.	Teaching quality evaluation method	Internal evaluation mechanisms and questionnaires		
22.	Course Material			
	22.1.	Mandatory course material		

No.	Author	Title	Publisher	Year
1	Hearn, Baker, Carithers	Computer Graphics with OpenGl, 4th edition	Pearson	2014
2	John F. Hughes, Andries van Dam, Morgan McGuire, David F. Sklar, James D. Foley, Steven K. Feiner, Kurt Akeley	Computer Graphics: Principles and Practice	Addison-Wesley Professional	2013
3	by John Kessenich, Graham Sellers, Dave Shreiner	OpenGL Programming Guide: The Official Guide to Learning OpenGL	Addison-Wesley Professional	2016

22.2.	Additional course material				
	No.	Author	Title	Publisher	Year