

Subject card

Subject name and code	3D Graphics Programming in OpenGL, PG_00210612						
Field of study	Informatics						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2026/2027		
Education level	Master's studies		Subject group		Obligatory subject group in the field of study Optional subject group		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		6.0		
Learning profile	academic		Assessment form		exam		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr Maciej Dziemiańczuk				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	60		0.0		0.0	60
Subject objectives	The aim of the course is to become familiar with and learn OpenGL mechanisms for generating and rendering three-dimensional graphics in real time on graphics cards. Another aim of the course is to introduce students to the subject-specific terminology in English.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[INFMU2_W03] has in-depth knowledge of programming paradigms and advanced programming constructs; knows current trends in programming languages		Knows the basic techniques of 3D graphics processing in the OpenGL library using a graphics card. Understands how three-dimensional objects are processed by graphics cards and displayed on a computer screen.		[SW4] test/exam - oral or written		
	[INFMU2_U01] can apply mathematical knowledge to formulate, analyze and solve tasks related to computer science		Is able to evaluate the differences between various 3D scene lighting algorithms and implement them in the OpenGL library using basic knowledge of geometry and vector calculus.		[SU2] presentation/project/paper/report		
Subject contents	1. Introduction to the OpenGL library. 2. Basics of generating three-dimensional objects on the screen using the OpenGL API. 3. Transformations of three-dimensional objects. 4. Colors, materials, textures, and lighting of three-dimensional objects. 5. Buffers in OpenGL. 6. Optimization methods. 7. Importing objects modeled in Blender or another graphics environment.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	projects		51.0%		50.0%		
	exam		51.0%		50.0%		
Recommended reading	Basic literature		1. OpenGL Reference Manual, Silicon Graphics, Inc. 2. LearnOpenGL.com - website. 3. Luke Benstead, Beginning OpenGL Game Programming, Cengage Learning PTR				

	Supplementary literature	not applicable
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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