University of Gdańsk

Subject card

Subject name and code	3D Graphics Programming in OpenGL, PG_00179252		
Field of study	Informatics		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2025/2026
Education level	Master's studies	Subject group	
Mode of study	part-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	1	ECTS credits	6.0
Learning profile	academic	Assessment form	exam
Conducting unit			
Name and surname of lecturer (lecturers)	Subject supervisor	dr Maciej Dziemiańczuk	
	Teachers	dr Maciej Dziemiańczuk	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	20.0	0.0	20.0	0.0	0.0	40

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	40	0.0	0.0	40

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_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
[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 threedimensional objects are processed by graphics cards and displayed on a computer screen.	[SW4] test/exam - oral or written

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
exam	51.0%	50.0%
projects	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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