GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00030017		
Field of study	Mathematics		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2022/2023
Education level	second-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Mathematics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Bartosz Reichel	
	Teachers	dr inż. Bartosz Reichel	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	45.0	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	5.0	35.0	100

Subject objectives

Understanding the basics of of graphics creation pipline on computers,

Learning basic operations and transformation (projection, rotation, filling, tessellation)

Knowledge of basic libraries 3D (OpenGL, DirectX)

Getting to know the Unity platform, to create a simple game.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K7_W07	Knows the quaternion algebra and can be used in graphic applications.	[SW1] Assessment of factual knowledge
K7_U06	He can apply the acquired knowledge in the implementation of graphic algorithms.	[SU3] Assessment of ability to use knowledge gained from the subject
K7_W12	Can use tools for symbolic calculations in such a way as to derive / optimize the equations needed to optimize calculations for algorithms.	[SW2] Assessment of knowledge contained in presentation
K7_U13	Consciously uses libraries included in graphic packages (eg OpenCV).	[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information
K7_K03	Responsible for the group project, participates in the work regularly.	[SK1] Assessment of group work skills

<table>
<tr><td>Subject contents</td><td>- Display Process: how it works on simple graphics card
- The process of creating 2D graphics
- Bitmaps operations (Terenary raster Operations)
- Collision in 2D systems
- The process of creating 3D graphics
- The importance of basic concepts in 3D graphics (eg camera) and elements associated with them
- Shaders (basic)
- Collisions in 3D
- Physics engine libraries for games
- Sound (playback, create / filtering)
- Input-output devices (HID devices)
- Use of platforms: OpenGL / DirectX, GDI +
- Unity Platform.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Implementation of tasks on the laboratory</td><td>50.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>• Pro C# 5.0 and the .NET 4.5 Framework,6th Edition,Andrew Troelsen, Apress
• Graphics Gems (I-V), Academic Press</td></tr><tr><td>Supplementary literature</td><td>Dave Calabrese, Unity 2D Game Development, March 2014, ISBN 139781849692564

or a similar from scope of Unity</td></tr><tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:
Programowanie gier komputerowych 2023 - Moodle ID: 29752
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29752</td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Implement a simple 2D game (eg. PAC MAN)</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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