GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	3D Spatial Data Visualisation, PG_00047975						
Field of study	Informatics						
Date of commencement of studies	October 2021		Academic year of realisation of subject	2024/2025			
Education level	first-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	4		Language of instruction	Polish			
Semester of study	7		ECTS credits	3.0			
Learning profile	general academic profile		Assessment form	exam			
Conducting unit	Department of Geoinformatics -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Marcin Kulawiak					
	Teachers	dr hab. inż. Marcin Kulawiak					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	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	30		3.0		42.0	75
Subject objectives	The goal of the lecture is to present algorithmic and programming methods of three-dimensional visualization of spatial data.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U43] can analyse date and formulate, apply and assess appropriate formal models and algorithms for solving problems in the field of information systems and applications	The student can create a simple application presenting a three-dimensional analysis of spatial data.	[SU1] Assessment of task fulfilment
	[K6_W42] Knows and understands, to an advanced extent, architecture, design principles and methods of hardware and software support for local and distributed information systems, including computing systems, databases, computer networks and information applications, as well as the principles of human cooperation with computers and computer-aided teamwork	The student knows the available programming tools supporting the creation of three-dimensional visualization of spatial data.	[SW1] Assessment of factual knowledge
	[K6_W04] Knows and understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such devices	The student knows the available methods and programming techniques supporting the creation of three-dimensional visualization of spatial data.	[SW1] Assessment of factual knowledge
	[K6_U03] can design, according to required specifications, and make a simple device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	The student is able to create a simple system of three-dimensional visualization of spatial data.	[SU4] Assessment of ability to use methods and tools
	[K6_W01] Knows and understands, to an advanced extent, mathematics necessary to formulate and solve simple issues related to the field of study	The student knows and understands the basic operations necessary for the construction of three-dimensional visualization of spatial data.	[SW1] Assessment of factual knowledge
Subject contents	3D graphics pipeline – review of hardware and software. Coordinate systems for spatial data. Theory of viewpoint calculation and camera navigation. Coordinate systems for spatial data. Spatial data programming using OpenGL standard. 3D graphics in Java environment. 3D graphics in WWW browsers. WebGL, Cesium.		
Prerequisites and co-requisites	Object Oriented Programming.		

<table>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Exam</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>Laboratory</td><td>60.0%</td><td>50.0%</td></tr>
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<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">Richard S. Wright, Benjamin Lipchak, Nicholas Haemel: OpenGL SuperBible: Comprehensive Tutorial and Reference Addison-Wesley Professional; 5 edition (August 2, 2010)</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">N/A</td></tr>
<tr><td>eResources addresses</td><td colspan="2">Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">Building a three-dimensional visualization of data via anaglyphs.

Creating a three-dimensional Geographic Information system in Web technologies.</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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