



Subject card

Subject name and code	, PG_00069242						
Field of study	Civil Engineering						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2026/2027		
Education level	first-cycle studies		Subject group		Optional subject group		
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		1.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Transportation Engineering -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Kamila Szwaczkiewicz				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	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		2.0		18.0	50
Subject objectives	The aim of the course is to acquire basic knowledge and skills in design using BIM technology through the practical handling of information about railway and road infrastructure objects and the exchange of this information through a model.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_K01] Is aware of the key aspects of professional, ethical and social responsibility related to management, business operation, decision making and opinion formulation in civil engineering.	The student is aware of the key aspects of professional, ethical, and social responsibility related to management, business operations, decision-making, and opinion-forming in the design of railway and road infrastructure.	[SK5] Assessment of ability to solve problems that arise in practice [SK3] Assessment of ability to organize work [SK2] Assessment of progress of work [SK1] Assessment of group work skills
	[K6_U07] Design and build engineering structures in a sustainable manner, with care for the natural environment and a minimum carbon footprint	The student designs and constructs infrastructure facilities in a sustainable manner, with care for the natural environment and a minimal carbon footprint.	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
	[K6_W06] Demonstrates practical knowledge and understanding of materials, devices and tools, processes and technologies in the field of civil engineering (and their limitations).	The student demonstrates practical knowledge and understanding of materials, equipment and tools, processes and technologies in the field of railway and road infrastructure.	[SW3] Assessment of knowledge contained in written work and projects
	[K6_W07] Understand the investment's impact on the environment and the interrelationships and dependencies between the building structure and the natural environment	The student demonstrates an understanding of the impact of investments on the environment and the interrelationships and dependencies between a building and the natural environment.	[SW3] Assessment of knowledge contained in written work and projects
	[K6_U06] Conduct engineering activities in civil engineering subject area, using and applying practical knowledge and understanding of materials, equipment and tools, processes and technologies.	The student conducts engineering activities in the field of railway and road infrastructure, using and applying practical knowledge and understanding of the specifics of materials, equipment and tools, processes, and technologies.	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
Subject contents	Course content – laboratory - Introduction to 3D modeling in OpenRailDesigner; - Infrastructure design using BIM technology; - Document naming and numbering procedure; - Project Information Requirements for railway projects in the CPK Railway Subprogram; - Introduction to the use of BIM technology in road construction based on BIM-D01;		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	project	100.0%	100.0%

Recommended reading	Basic literature	Poliński J.: Metodyka BIM czym jest i komu służy. Prace Instytutu Kolejnictwa, Zeszyt 167, 2021. ormann A., König M., Koch C., Beetz J.: Building Information Modeling, Technology Foundations and Industry Practice. Springer International Publishing AG, 2018. Ryciuk U., Rollnik-Sadowska E., Małaszkiwicz D.: BIM Uwarunkowania i perspektywy wdrażania w Polsce. Oficyna Wydawnicza Politechniki Białostockiej, Białystok 2024. Urząd Zamówień Publicznych: BIM innowacyjne podejście do zamówień publicznych w sektorze budowlanym. Warszawa-Gdańsk 2022. Polski Związek Pracodawców Budownictwa: BIM Standard PL. Warszawa 2020. Wzorce i standardy rekomendowane przez Ministra właściwego ds. transportu: BIM-D-01-01 Wprowadzenie do stosowania technologii BIM w budownictwie drogowym (wersja 01 obowiązująca od 27 czerwca 2022 r.). Magiera J.: Wymiana danych w formatach OpenBIM w projektach infrastrukturalnych. Przewodnik Projektanta, nr 3/2021, Polska Izba Inżynierów Budownictwa, Warszawa 2021.
	Supplementary literature	Kwon T. H., Park S. I., Jang Y. H., Lee S. H.: Design of Railway Track Model with Three-Dimensional Alignment Based on Extended Industry Foundation Classes. Applied Sciences (Switzerland), wydanie 10, nr 10, maj 2020. Neves J., Sampaio Z., Vilela M.: A Case Study of BIM Implementation in Rail Track Rehabilitation. Infrastructures (Basel), wydanie 4, nr 1, luty 2019. Magiera J.: Georeferencja modeli BIM. Przewodnik Projektanta, nr 4/2022, Polska Izba Inżynierów Budownictwa, Warszawa 2022
	eResources addresses	
	Example issues/ example questions/ tasks being completed	
Practical activities within the subject	Not applicable	

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