GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00069312						
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	Obligatory subject group 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	1.0			
Learning profile	general academic profile		Assessment form	assessment			
Conducting unit	Department of Engineering Structures -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Maciej Lewandowski-Szewczyk				
	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						
	eNauczanie source addresses: Moodle ID: 7417 BIM 2 KBI 2026/27 https://enauczanie.pg.edu.pl/2025/course/view.php?id=7417						
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		0.0		0.0	30
Subject objectives	The aim of the course is to provide students with basic practical knowledge of modelling in BIM technology using modern IT tools, namely Tekla Structures software. Students will acquire the skills to create detailed three-dimensional models of steel structures and concrete elements. The course enables students to develop the ability to apply engineering knowledge, use modern digital tools, critically analyse information and solve technical problems. The course responds to market demand.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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 possesses practical knowledge of the properties, applications, and limitations of materials and technologies used in construction	[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 understands the environmental impact of civil engineering structures and is able to recognize the relationships and interactions between a construction project and the natural environment	[SW3] Assessment of knowledge contained in written work and projects
[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 building structures with respect for the principles of sustainable development and with the aim of minimizing environmental impact	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task
[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 importance of professional and ethical responsibility in managing projects within the BIM environment and is able to work effectively as a member of a project team	[SK1] Assessment of group work skills [SK3] Assessment of ability to organize work [SK5] Assessment of ability to solve problems that arise in practice
[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 is able to apply practical knowledge of building materials, tools, and construction technologies to create three-dimensional building models using BIM systems. The student is able to analyze and interpret design data and use it effectively in the process of modeling and documenting building structures. The student is able to efficiently use BIM software tools and methods to develop structural models and generate technical drawings	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task

Subject contents

Course content – laboratory

1. **Introducing students** to the principles of working with computer programs that meet the requirements of the BIM (Building Information Modeling) methodology.
2. **Development of an architectural and construction design** for a building structure that includes all commonly used structural elements in construction, such as: strip and pad foundations, masonry walls with external ETICS insulation, reinforced concrete tie beams and lintels, reinforced concrete columns, reinforced concrete floor slabs, steel beams and joists, steel columns, wooden structural elements of a gable roof in the form of timber trusses, roof coverings, window and door joinery, and building finishing elements.
3. **Preparation of detailed drawings** for the load-bearing elements of the designed building using specialized structural design software.
4. **Development of design and workshop documentation** for all structural elements, including material take-offs and construction details.
5. **Preparation of a comprehensive architectural and construction documentation** of the building (including structural elements).
6. **Creation of visualizations** of the designed building.
7. **Clash detection and model coordination** for the designed building.
8. **Presentation of the project results.**

Prerequisites and co-requisites

Knowledge in the field of design and development of building structures, as well as the design of reinforced concrete and steel elements forming the structural framework of buildings.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
demonstration of practical skills acquired	60.0%	40.0%
micro-tasks on selected elements	60.0%	20.0%
building model and shop drawings	60.0%	40.0%

Recommended reading	Basic literature	1. Bednarczyk i inni, BIM Standard PL, Warszawa 2020 (dostępny w sieci Internet). 2. Kasznia D., Magiera J., Wierzowiecki P., BIM w praktyce, standardy, wdrożenia, case study, Wydawnictwo Naukowe PWN, Warszawa, 2017. 3. Anger A., Łaguna P., Zamara B., BIM dla managerów, Wydawnictwo Naukowe PWN, Warszawa, 2021. 4. Kacprzyk Z., Projektowanie w procesie BIM, Oficyna Wydawnicza Politechniki Warszawskiej, WARSAWA, 2020. 5. Tomana A., Bim Innowacyjna Technologia w Budownictwie. Podstawy, standardy, narzędzia, Kraków 2015. 6. Eastman, C., Teicholz, P., Sacks, R., & Liston, K. 2011. BIM handbook: A guide to building information modeling for owners, managers, designers, engineers and contractors. Indianapolis, IN: Wiley. 7. Trimble - Tekla Campus - dokumentacja, oprogramowanie komputerowe,
	Supplementary literature	1. Publications of the Ministry of Infrastructure 2. Publications of the Public Procurement Office 3. Publications of the Ministry of Development 4. ISO 19650 standard
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Practical activites within the subject	Not applicable	

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