



Subject card

Subject name and code	, PG_00069273						
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				
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		assessment		
Conducting unit	Department of Building Structures and Material Engineering -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Łukasz Skarżyński				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	0.0	0.0	45
	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	45		4.0		26.0	75
Subject objectives	The aim of the course is for students to acquire knowledge about possible solutions for strengthening masonry, wooden, steel and reinforced concrete structures.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[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.	Student has general knowledge in this field.	[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_W07] Understand the investment's impact on the environment and the interrelationships and dependencies between the building structure and the natural environment	Student has general knowledge in this field.	[SW2] Assessment of knowledge contained in presentation
	[K6_W06] Demonstrates practical knowledge and understanding of materials, devices and tools, processes and technologies in the field of civil engineering (and their limitations).	Student has general knowledge in this field.	[SW2] Assessment of knowledge contained in presentation [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	Student has general knowledge in this field.	[SU2] Assessment of ability to analyse information
	[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.	Student has general knowledge in this field.	[SK1] Assessment of group work skills [SK5] Assessment of ability to solve problems that arise in practice
Subject contents	Course content – lecture 1. Analysis of legal conditions. 2. Methodology for strengthening masonry structures. 3. Methodology for strengthening timber structures. 4. Methodology for strengthening steel structures. 5. Methodology for strengthening reinforced concrete structures.		
	Course content – exercises 1. Design task for strengthening a masonry element. 2. Design task for strengthening a wooden element. 3. Design task for strengthening a steel element. 4. Design task for strengthening a reinforced concrete element. 5. Presentation of design tasks.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Colloquium	50.0%	60.0%
	Project	50.0%	40.0%

Recommended reading	Basic literature	1. Maślowski E., Spiżewska D.: Wzmacnianie konstrukcji budowlanych. Arkady 1999. 2. Małyszko L., Orłowicz R.: Konstrukcje murowe zarysowania i naprawy. Wydawnictwo Uniwersytetu Warmińsko-Mazurskiego w Olsztynie 2000. 3. Konstrukcje murowe Lech Rudziński Politechnika Świętokrzyska 2006. 4. Naprawy Elementów Budowlanych w budynkach mieszkalnych realizowanych metodami uprzemysłowionymi. Inwestprojekt Łódź 1994. 5. Trwałość i skuteczność napraw obiektów budowlanych. Dolnośląskie Wydawnictwo Edukacyjne 2007. 6. Mitel A., Stachurski W., Suwalski J.: Awarie konstrukcji betonowych i murowych. Arkady 1973. 7. Materiały Konferencyjne: Warsztat Pracy Projektanta Konstrukcji WPPK. Ustroń-Wisła-Szczyrk 1998-2008. 8. Materiały informacyjne firm zajmujących się opracowywaniem i wdrażaniem nowych rozwiązań technologicznych oraz konstrukcyjno-materiałowych w budownictwie ogólnym.
	Supplementary literature	No requirements.
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Develop a reinforcement for the masonry pillar between the windows. 2. Develop a reinforcement for the rafters of a wooden collar beam roof. 3. Develop a reinforcement for the steel roof truss girder. 4. Develop a reinforcement for the structural elements of a reinforced concrete slab-ribbed ceiling.	
Practical activities within the subject	Not applicable	

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