



Subject card

Subject name and code	, PG_00069776						
Field of study	Obiekty inżynieryjne w transporcie lądowym						
Date of commencement of studies	February 2025		Academic year of realisation of subject		2025/2026		
Education level	second-cycle studies		Subject group				
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		3.0		
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. Marek Szafrąński				
	Teachers		dr inż. Marek Szafrąński dr hab. inż. Marcin Abramski				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	15.0	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		0.0		0.0	45
Subject objectives	Acquiring and application of the background on shaping, erection, maintenance, diagnostics, dynamic impact and lifetime of engineering systems						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U101] is able to formulate complex research problems and adopts appropriate methods, obtaining innovative solutions, cooperating with other people, both as a leader and a team member		The student surveys and visually assesses technical condition of road engineering structure, due to applicable regulations and guidelines, the student exposes basic experimental and diagnostic background of engineering systems		[SU1] Ocena realizacji zadania		
	[K7_W101] is able to make an in-depth identification of key objects and phenomena related to the field of study, as well as theories that describe them and applicable analytical and design methods		The student identifies structure and facilities of the present engineering systems. The student points out failures of a structure and its facilities		[SW1] Ocena wiedzy faktograficznej		
	[K7_K101] acknowledges the importance of knowledge related to the field of study in solving cognitive and practical problems, critically assessing the information obtained		the student exposes background on operation and maintenance of engineering systems. The student recognizes the impact of real service loads to dynamics and lifetime of systema		[SK2] Ocena postępów pracy		

Subject contents	Course content – lecture 1. Poland's communication infrastructure. 2. Road and rail engineering structures - design and examples of real-world structures. 3. Contemporary bridge construction technologies - examples and selected projects of real-world structures. 4. Damage to engineering structures (structure, equipment) - types, causes, and examples of real-world structures. 5. Repair, reinforcement, and modernization of engineering structures - examples. 6. Testing bridge structures in structural diagnostics. 7. The impact of operational loads on bridges and their impact on the lifespan of the structure.		
	Course content – exercises 1. Educational tours of selected bridges in Gdańsk - discussion of the structure, equipment, and existing damage. 2. Bridge inspections: a) types and principles of inspections, b) development of basic inspection cards based on examples of actual structures		
	Course content – project 1. Desig of engineering structures a) Selection of the geometry and cross-section of a selected type of road bridge span, b) Selection of the geometry and cross-section of a selected type of railway bridge span. 2. Performing an extended inspection of an existing bridge structure - teamwork		
Prerequisites and co-requisites	no items		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		60.0%	100.0%
Recommended reading	Basic literature	1. Bień J. [2010]: Uszkodzenia i diagnostyka obiektów mostowych, WKiŁ, 2010. 2. Wysokowski A. [2022]: Trwałość mostów stalowych, PWN, Warszawa 2022. 3. Madaj A., Wołowicki W. [2007]: Budowa i utrzymanie mostów, WKiŁ, 2007. 4. Zobel. H., Al-Khafaii T. [2024]: Mosty Metalowe, PWN Warszawa, 2024. 5. GDDKiA [2020]: Instrukcje przeprowadzania przeglądów drogowych obiektów inżynierskich, GDDKiA, Warszawa 2020. 6. WR-M-23 Wytyczne wykonywania badań drogowych obiektów mostowych pod próbnym obciążeniem. Warszawa 2021.	
	Supplementary literature	1. Czudek H. Radomski W. [1983]: Podstawy mostownictwa. PWN, Warszawa 1983. 2. Bień J., [2002]. Modelowanie obiektów mostowych w procesie ich eksploatacji, Dolnośląska Biblioteka Cyfrowa, 2002. 3. Praca zbiorowa [2012]: Trwałość obiektów mostowych. Seminarium Wrocławskie Dni Mostowe. DWE, Wrocław 2012. 4. Chmielewski T., Zembaty Z. [1998]. Podstawy Dynamiki Budowli. ARKADY, Warszawa, 1998. 5. Kühn B, [2013]. Assessment of Existing Steel Structures: Recommendations for Estimation of Remaining Fatigue Life. Procedia Engineering, 66, 3-11 (2013). 6. Fryba L. [1972]. Vibration of Solids and Structures under Moving Loads. Thomas Telford, 1972.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Educational trips to the existing bridge structures of Gdańsk - structures, facilities and failures		
Practical activites within the subject	Educational trips to the existing bridge structures of Gdańsk - structures, facilities and failures		

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