



Subject card

Subject name and code	, PG_00069216						
Field of study	Nowoczesne struktury inżynierskie - modelownie i konstrukcja						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2025/2026		
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 none		
Semester of study	7		ECTS credits		5.0		
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 hab. inż. Krzysztof Żółtowski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	30.0	0.0	0.0	0.0	45
	E-learning hours included: 0.0						
	eNauczanie source addresses: Moodle ID: 2774 Nowoczesne struktury inżynierskie - modelownie i konstrukcja https://enauczanie.pg.edu.pl/2025/course/view.php?id=2774						
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		10.0		70.0	125
Subject objectives	The aim is to familiarize students with contemporary principles of designing and modeling engineering structures. The classes will cover interesting structures and their theoretical models used for analyzing forces, stresses, and deformations. The classes will focus on steel, reinforced concrete, and prestressed structures. A field trip is planned.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_K03] Can effectively, clearly and unambiguously convey information, describe activities and communicate their results/ outcomes to engineers or a wider audience using appropriate communication methods and tools.		Becoming acquainted with general principles regarding the shaping of structures as a system and as a detail		[SK5] Ocena umiejętności rozwiązywania problemów występujących w praktyce		
	[K6_K04] Engages in independent lifelong learning and individually follows the development of science and technology in the field of civil engineering.		Practice in independently searching for data or solutions useful for achieving the objective		[SK5] Ocena umiejętności rozwiązywania problemów występujących w praktyce		

Subject contents	Course content – lecture Fundamentals of mechanics of bar, surface, and solid structures in practice Examples of realized cable structures descriptions of theoretical models Examples of realized beam structures descriptions of theoretical models Examples of realized shell structures descriptions of theoretical models Examples of realized solid structures descriptions of theoretical models Course content – exercises Finite Element Modeling of Structural Components Assumptions, Limitations, and Verification Procedures. Beam Model Analysis of a Structure Consequences of Modeling and Elements of Model Verification. Truss Structure Consequences of Modeling and Elements of Model Verification. Structural Prestressing Consequences of Modeling and Elements of Model Verification. Buckling Analysis Modeling and Basic Calculations.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Evaluation of the substantive content prepared by the student in the form of an essay on a selected topic related to modern engineering structures.	60.0%	100.0%

Recommended reading	Basic literature	Czudek H., Radomski W.: Fundamentals of Bridge Engineering. PWN, Warsaw, 1983. Leonhardt F.: Bridge Construction. WKiŁ, Warsaw, 1982. Madałaj A., Wołowicki W.: Construction and Maintenance of Bridges. WKiŁ, Warsaw, 1995. Furtak K.: Composite Bridges. PWN, WarsawKraków, 1999. Hydzik J.: Railway Bridges. WKiŁ, Warsaw, 1986. Ryżyński A., Wołowicki W., Skarżewski J., Karlikowski J.: Steel Bridges. PWN, WarsawPoznań, 1984. Danielski L.: Metal Bridges. Wrocław University of Technology, Wrocław, 1983. Biliszczyk J.: Cable-Stayed Bridges. ARKADY, Warsaw, 2005. Frei Otto, Dachy wiszące, Arkady 1959 TOMLOW J. Designing and constructing the Olympic roof (Munich 1972). <i>International Journal of Space Structures</i>. 2016;31(1):62-73. ALLEN E., ZALEWSKI W, <i>Form and Forces: Designing Efficient, Expressive Structures</i>. John Wiley & Sons, Inc. 2009
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	Supplementary literature	Cholewo J., Sznurowski M.: Railway Bridges and Foundation Engineering. WKiŁ, Warsaw, 1965. Korelewski J.: Steel Bridges. Cracow University of Technology, Kraków, 1980. Szelągowski F.: Metal Bridges. WKiŁ, Warsaw, 1966. Pszenicki A.: Riveted Steel Bridges. Wydawnictwa Komunikacyjne, Warsaw, 1954. Furtak K.: Composite Bridges. PWN, WarsawKraków, 1999. Jarominiak A.: Cable-Stayed Bridges. Publishing House of the Rzeszów University of Technology, Rzeszów, 1997. Karlikowski J., Sturzbecher K.: Steel Bridges. Girder and Composite Bridges. Design Exercise Guide. Poznań University of Technology, Poznań, 2003. GÖPPERT, K., HASPEL, L.. National Stadium Warsaw, Poland. <i>Structural Engineering International</i>, 23(3), 311316, 2013 ŻÓŁTOWSKI K., TOMASZ S.: Recent steel structures in Poland - the selected projects, W: <i>13th International Conference on Metal Structures (ICMS)</i>, 2016,
	eResources addresses	
Example issues/ example questions/ tasks being completed	Provide an example of a modern engineering structure. For the presented structure, explain the main characteristics of its structural behavior (load-carrying mechanism). For the presented structure, identify the elements that carry the loads resulting from self-weight. For the presented structure, identify the elements that carry the loads resulting from temperature effects. For the presented structure, identify the elements that carry the loads resulting from wind.	
Practical activities within the subject	Not applicable	

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