

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Complex metal structures, PG_00041065							
Field of study	Civil Engineering							
Date of commencement of studies	February 2024		Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies		Subject group			Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
Mode of study	Full-time studies		Mode of delivery			at the university		
Year of study	1		Language of instruction			Polish		
Semester of study	1		ECTS credits			4.0		
Learning profile	general academic profile		Assessment form			assessment		
Conducting unit	Department of Metal Structures -> Faculty of Civil and Environmental Engineering							
Name and surname of lecturer (lecturers)	Subject supervisor dr hab. inż. Elżbieta Urbańska-Galewska							
	Teachers		dr hab. inż. Elżbieta Urbańska-Galewska					
			dr inż. Aleksander Perliński					
			dr inż. Natalia Korcz-Konkol					
			dr inż. Witold Knabe					
			mgr inż. Paweł Pieczka					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM
	Number of study hours	30.0	15.0	0.0 15.0			0.0	60
	E-learning hours included: 0.0							
Learning activity and number of study hours	Learning activity Participation ir classes includ plan		i didactic Participation in ed in study consultation hours		Self-study SUM			
	Number of study hours	60	5.0		35.0		100	
Subject objectives	To acquaint students with the structures of high-rise buildings, tanks, masts, chimneys, and towers as well as advanced methods of steel structure analysis.							
Learning outcomes	Course outcome		Subject outcome		Method of verification			
	[K7_W02] knows principles of analysis, design and dimensioning of complex constructions and its elements		The student learns the principles of analysis, construction, and dimensioning of elements of complex metal structures			[SW3] Assessment of knowledge contained in written work and projects		
	[K7_W04] has knowledge on advanced strength of materials, modeling and optimisation of materials and constructions; has knowledge of fundamentals of Finite Element Method and general nonlinear analysis of engineering constructions and systems		Students know the principles of designing structures in a post- critical state			[SW3] Assessment of knowledge contained in written work and projects		
	[K7_U02] can design and dimension complex steel, concrete (including reinforced), wood and masonry construtions and its details		The student can design elements and complex metal structures			[SU1] Assessment of task fulfilment		
	[K7_W14] knows and applies building codes and obeys the Construction Law; has knowledge on environmetal impact of investment realisation		Students design steel structure elements using appropriate standards of environmental and operational impact on structures as well as standards for the design of steel structures			[SW3] Assessment of knowledge contained in written work and projects		

Subject contents	Load-bearing of steel structures elements in the postcritical state.							
	Dimensioning of steel plate girders. Spatial lattice structure. Design and shaping of hollow section structures.							
	Models and analysis of steel structure, Multi-storey buildings structures examples of implementation. Types of tanks. Tanks for liquid fuels the relationship between the properties of the fuel and the type of tank,							
	Design of vertical cylindrical tanks. Prestressed steel structures - the aim, materials and construction. Metal sheeting acting as a diaphragm.							
	Chimneys, towers, masts - general characteristics, types, static calculation, design solutions.							
Prerequisites and co-requisites								
Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade					
and criteria	design of the steel floor	60.0%	8.0%					
	active participation in classes	0.0%	12.0%					
	Summary assessment of tests and quizzes concerning the lecture content carried out during the semester	60.0%	50.0%					
	Colloquium concerning exercises	60.0%	30.0%					
Recommended reading	Basic literature Supplementary literature	 Bródka J., Brodniewicz M. <i>Projektowanie konstrukcji stalowych wg</i> <i>Eurokodów.</i> PWT, Rzeszów 2009 Giżejowski M., Ziółko J. <i>Budownictwo ogólne Stalowe konstrukcje</i> <i>budynków projektowanie wg Eurokodów z przykładami obliczeń.</i> Tom V. Arkady, Warszawa 2010. Witold Kucharczuk: <i>Stalowe hale i budynki wielokondygnacyjne.</i> Wydawnictwa Politechniki Częstochowskiej, Częstochowa 2004. Kazimierz Rykaluk: <i>Konstrukcje stalowe. Kominy, wieże, maszty.</i> Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2004. Jerzy Ziółko: <i>Zbiorniki metalowe na ciecze i gazy.</i> Arkady, Warszawa 1986. Bródka J., Kozłowski A.: <i>Stalowe budynki szkieletowe.</i> Oficyna Wydawnicza Politechniki Rzeszowskiej. Rzeszów 2003. PN-EN-1993-1-1:2006, PN-EN-1993-1-8:2006, PN- EN-1991-1-1:2004, PN-EN 1991-1-3:2005, PN-EN 1991-1-4:2008 Bródka J., Broniewicz M.: Konstrukcje stalowe z rur. Arkady, 						
		 Warszawa 2001. Mieczysław Łubiński, Wojciech Żółtowski: Konstrukcje metalowe. Część II. Arkady, Warszawa 2004. PN-90 / B-03200. Konstrukcje stalowe. Obliczenia statyczne i projektowanie. PN-B- 03215:1998. Konstrukcje stalowe. Połączenia z fundamentami. Projektowanie i wykonanie. 						
	eResources addresses Adresy na platformie eNauczanie:							
Example issues/ example questions/ tasks being completed	Mark the effective surface on the compression I-cross section when the web is class 4 List and sketch possible failure mechanisms of truss nodes made of CHS sections							
	List and sketch basic planar systems bracing tall buildings							
	List the ways of preventing vibrations of steel chimneys and briefly describe the principles of their operation							
Work placement	Not applicable							

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