



Subject card

Subject name and code	Steel Structures , PG_00042238						
Field of study	Civil Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group			Optional subject group 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	2	ECTS credits			5.0		
Learning profile	general academic profile	Assessment form			exam		
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. Witold Knabe dr hab. inż. Piotr Iwicki					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	45.0	15.0	0.0	15.0	0.0	75
	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	75		5.0		45.0	125
Subject objectives	Understanding the structure of metals and the influence of alloy components and heat treatment on material properties. Ability to select the appropriate steel grade and assess the safety of structural systems. Knowledge of advanced methods of dimensioning metal structures.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_W14] knows and applies building codes and obeys the Construction Law; has knowledge on environmental impact of investment realisation	The student has an organized and in-depth knowledge of the field of construction and the specialization of Metal Structures			[SW1] Assessment of factual knowledge		
	[K7_U02] can design and dimension complex steel, concrete (including reinforced), wood and masonry constructions and its details	The student knows the principles of construction and dimensioning of class 4 steel structure elements			[SU1] Assessment of task fulfilment		
	[K7_U01] can evaluate and list any loads acting on constructions	The student is able to independently perform a design task			[SU1] Assessment of task fulfilment		
	[K7_W02] knows principles of analysis, design and dimensioning of complex constructions and its elements	The student knows the principles of construction and dimensioning of class 4 steel structure elements			[SW1] Assessment of factual knowledge		
Subject contents	Load capacity of steel structure elements in a postcritical state. Safety and reliability of steel structures. Shaping and dimensioning of tension connections with bolts. preloaded tension and shear connections. Semi-rigid connections in steel structures. Design of steel structures taking into account the plastic capacity reserve and material fatigue. Structure of the steel material . The influence of alloying elements and heat treatment on the mechanical properties of steel. Selection of steel grades for structures depending on their operating conditions. Material toughness and through-thickness properties.						
Prerequisites and co-requisites							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	2 x colloquium	60.0%	24.0%
	project	60.0%	16.0%
	exam	60.0%	60.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> Giżejowski M., Ziółko J. <i>Budownictwo ogólne Stalowe konstrukcje budynków projektowanie wg Eurokodów z przykładami obliczeń</i>. Tom V. Arkady, Warszawa 2010. Bródka J., Kozłowski A., Ligocki I., Łąguna J., Ślęcka L.: <i>Projektowanie i obliczanie połączeń i węzłów konstrukcji stalowych</i>. Tom 2. PWT. 2015. Mieczysław Łubiński, Wojciech Żółtowski: <i>Konstrukcje metalowe</i>. Część II. Arkady, Warszawa 2004. Żmuda J.: <i>Konstrukcje wsporcze dźwignic</i>. Wydawnictwo Naukowe PWN 2013. Rykaluk K.: <i>Pęknięcia w konstrukcjach stalowych</i>. Dolnośląskie Wydawnictwo Edukacyjne. Wrocław 2000. Biegus A.: <i>Probabilistyczna analiza konstrukcji stalowych</i>. Wydawnictwo Naukowe PWN. Warszawa-Wrocław 1999. Biegus. A.: <i>Nośność graniczna stalowych konstrukcji prętowych</i>. Wydawnictwo Naukowe PWN. Warszawa-Wrocław 1997. Pałkowski Sz.: <i>Konstrukcje stalowe</i>. Wybrane zagadnienia obliczania i projektowania. Wydawnictwo Naukowe PWN. Warszawa-Wrocław 2001. 	
	Supplementary literature	<ol style="list-style-type: none"> PN-EN 1993-1-1 Eurokod 3: <i>Projektowanie konstrukcji stalowych</i>. Część 1-1: Reguły ogólne i reguły dla budynków. PN-EN 1993-1-8 Eurokod 3: <i>Projektowanie konstrukcji stalowych</i>. Część 1-8: Projektowanie węzłów PN-EN 1993-6 Eurokod 3: <i>Projektowanie konstrukcji stalowych</i>. Część 6: Konstrukcje wsporcze dźwignic. 	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	<p>Explain the concept of a plastic hinge</p> <p>Explain what is the reliability of steel structures</p> <p>What is a semi-rigid joint</p> <p>Create a spectrum of loads on a building structure</p> <p>Determine the fatigue resistance of the steel structure</p>		
Work placement	Not applicable		