GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Complex Steel Structures I, PG_00072507		
Field of study	Civil Engineering		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
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	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Metal Structures -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Tomasz Heizig	
	Teachers	dr inż. Dariusz Kowalski	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	15.0	0.0	30

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	30	2.0	18.0	50

Subject objectives

Gaining knowledge on: the load-bearing capacity of steel elements in the post-critical state; the dimensioning of plate girders and three-dimensional truss systems; the design and configuration of structures using closed-section profiles; lightweight building envelope systems and glass-metal facades; the load-bearing systems of multi-story buildings; the interaction between a hall's structural framework and its lightweight envelope; as well as the structural design and static/strength analysis of towers and masts.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W06] demonstrates in-depth preparation for the design of advanced construction processes, systems and facilities, taking into account the technical, environmental, economic, legal and ethical contexts	The student has general knowledge regarding the design of complex metal structures, such as towers, masts, high-rise buildings, and spatial lattice structures.	[SW3] Assessment of knowledge contained in written work and projects
[K7_U06] develops innovative solutions to complex problems and designs advanced construction processes, systems and facilities	The student has general knowledge regarding the structural solutions employed in complex metal structures, such as towers, masts, high-rise buildings, and spatial lattice structures.	[SU3] Assessment of ability to use knowledge gained from the subject

Subject contents

Course content – lecture

Projekt wybranych elementów stropu stalowego i ich połączeń (belek drugorzędnych oraz podciągu - elementu w klasie 4).

Course content – project

Design of selected elements of a steel floor structure and their connections (secondary beams and a primary beam – an element in Class 4).

Prerequisites and co-requisites

The student is familiar with the properties of steel, the range of available steel components, and the fundamental principles related to the dimensioning and design of steel elements and their connections. The student is capable of designing and constructing planar load-bearing structures, such as frames and trusses.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Zaliczenie pisemne	60.0%	50.0%
Ocena z projektu i kolokwium	60.0%	50.0%

Recommended reading	Basic literature	1. Bogucki W., Żyburtowicz M.: Tablice do projektowania konstrukcji metalowych. Arkady, Warszawa 2007. 2. Bródka J., Broniewicz M.: Projektowanie konstrukcji stalowych według Eurokodów. Materiały szkoleniowe. Polskie Wydawnictwo Techniczne, Rzeszów 2010. 3. Bródka J., Kozłowski A.: Stalowe budynki szkieletowe. Oficyna Wydawnicza Politechniki Rzeszowskiej. Rzeszów 2003. 4. Giżejowski M., Ziółko J.: Budownictwo ogólne – Stalowe konstrukcje budynków projektowanie wg Eurokodów z przykładami obliczeń. Tom V. Arkady, Warszawa 2010. 5. Goczek J., Supeł Ł., Gajdzicki M.: Przykłady obliczeń konstrukcji stalowych, Wydawnictwo PŁ, Łódź 2010. 6. Kucharczuk W.: Stalowe hale i budynki wielokondygnacyjne. Wydawnictwa Politechniki Częstochowskiej, Częstochowa 2004. 7. Pałkowski Sz.: Konstrukcje stalowe. Wybrane zagadnienia obliczania i projektowania. PWN, Warszawa 2010 8. Pałkowski Sz.: Podstawy stateczności stalowych konstrukcji prętowych. Wydawnictwo Uczelniane Politechniki Koszalińskiej, Koszalin 2016. 9. Praca zbiorowa pod red. A. Kozłowskiego: Konstrukcje stalowe. Przykłady obliczeń według PN-EN 1993-1. Część pierwsza. Wybrane elementy i połączenia. Oficyna Wydawnicza PRz, Rzeszów 2009. 10. Praca zbiorowa pod red. A. Kozłowskiego: Konstrukcje stalowe. Przykłady obliczeń według PN-EN 1993-1. Część druga. Stropy i pomosty. Oficyna Wydawnicza PRz, Rzeszów 2011. 11. Praca zbiorowa pod red. A. Kozłowskiego: Konstrukcje stalowe. Przykłady obliczeń według PN-EN 1993-1. Część trzecia. Hale i wiaty, Oficyna Wydawnicza PRz, Rzeszów 2015.
	Supplementary literature	1. Rykaluk K.: Konstrukcje stalowe. Podstawy i elementy. DWE, Wrocław 2001. 2. Żmuda J.: Projektowanie konstrukcji stalowych. Cz.1. Dźwigary kratownicowe, słupy, ramownice. 3. Żmuda J.: Projektowanie konstrukcji stalowych. Cz.2. Belki, płatwie, węzły i połączenia, ramy, łożyska.
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Check the load-bearing capacity of the girder. 2. Check the load-bearing capacity of the connection between the beam and the girder. 3. Draw a joint of a space truss. 4. Describe the advantages of the interaction between a hall’s structural framework and its lightweight envelope (cladding).	
Practical activites within the subject	Not applicable	

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