GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00069432		
Field of study	Civil Engineering		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2025/2026
Education level	first-cycle studies	Subject group	Optional subject group
Mode of study	Part-time studies	Mode of delivery	at the university
Year of study	4	Language of instruction	Polish
Semester of study	7	ECTS credits	4.0
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. Tomasz Heizig	
	Teachers	dr inż. Aleksander Perliński dr hab. inż. Piotr Iwicki dr inż. Tomasz Heizig	

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	20.0	0.0	0.0	20.0	0.0	40
	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	40	5.0	55.0	100

Subject objectives	To familiarize students with advanced methods supporting the design of steel structures.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U07] Design and build engineering structures in a sustainable manner, with care for the natural environment and a minimum carbon footprint	Knows and is able to apply advanced design techniques that support optimal design.	[SU4] Assessment of ability to use methods and tools
[K6_U06] Conduct engineering activities in civil engineering subject area, using and applying practical knowledge and understanding of materials, equipment and tools, processes and technologies.	Is able to properly select design tools and methods.	[SU4] Assessment of ability to use methods and tools
[K6_K01] Is aware of the key aspects of professional, ethical and social responsibility related to management, business operation, decision making and opinion formulation in civil engineering.	Knows the impact of their own actions and decisions on the work being carried out. Is aware of the responsibilities of a structural engineer in the construction process.	[SK5] Assessment of ability to solve problems that arise in practice
[K6_W07] Understand the investment's impact on the environment and the interrelationships and dependencies between the building structure and the natural environment	Understands the environmental impact of optimal steel structure design.	[SW3] Assessment of knowledge contained in written work and projects
[K6_W06] Demonstrates practical knowledge and understanding of materials, devices and tools, processes and technologies in the field of civil engineering (and their limitations).	Able to use modern software to analyze spatial steel structures.	[SW3] Assessment of knowledge contained in written work and projects

Subject contents

Course content – lecture
Defining of 3D numerical model. Stability analyses (torsional buckling, buckling) using member and shell elements. FEM calculations for metal structures based on LA, LBA, GNA, and GNMiA standards, along with examples.

Course content – project
Creating a spatial computational model using CAD software. Validating the model. Creating load combinations while taking into account standard requirements. Dimensioning elements and their connections using modern software.

Prerequisites and co-requisites

Student knows the basic principles of design and is able to create 2D computational models (2D) using engineering software.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
	60.0%	50.0%
	60.0%	50.0%

Recommended reading

Basic literature	1. EN 1993-1-14. Eurocode 3. Design of steel structures. Design assisted by finite element analysis/ 2. Program ARSA - podręcznik użytkownika.
Supplementary literature	1. Modelowanie konstrukcji budowlanych. Kacprzyk Zbigniew, Dudziak Sławomir, Czumaj Przemysław.
eResources addresses	

Example issues/ example questions/ tasks being completed

Preparation of a spatial computational model of the steel hall structure using a computational program. Creation of load combinations and dimensioning of elements and their connections.

Practical activites within the subject

Not applicable