GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Steel Structures III, PG_00069285		
Field of study	Civil Engineering		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2026/2027
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
Semester of study	7	ECTS credits	1.0
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. Piotr Iwicki	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	0.0	0.0	15

E-learning hours included: 0.0

eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=2266

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	15	1.0	9.0	25

Subject objectives

The aim of the course is to familiarize students with current issues in numerical analysis of metal structures, with particular emphasis on spatial static analysis, linear bifurcational analysis (LBA), and dimensioning. Issues related to the calculation of the statics of spatial steel hall models will be presented.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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.	The student has knowledge related to structural safety risks.	[SK2] Assessment of progress of work
[K6_U07] Design and build engineering structures in a sustainable manner, with care for the natural environment and a minimum carbon footprint	The student has knowledge of the need for economical structural design.	[SU1] Assessment of task fulfilment
[K6_W06] Demonstrates practical knowledge and understanding of materials, devices and tools, processes and technologies in the field of civil engineering (and their limitations).	The student has knowledge of the limitations in the construction of structural models.	[SW1] Assessment of factual knowledge
[K6_W07] Understand the investment's impact on the environment and the interrelationships and dependencies between the building structure and the natural environment	The student has knowledge of the need for economical structural design.	[SW1] Assessment of factual knowledge
[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.	The student is able to build a numerical model of a spatial steel bar structure in the ARSA program and perform static calculations and dimensioning of its elements.	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject

<table>
<tr><td>Subject contents</td><td>Course content – lecture

Lecture: Selected examples of spatial modeling of metal engineering structures. Use of ARSA software for linear static analysis and structural dimensioning.
Examples of static calculations, stability and dimensioning of metal structures.
Project:
Construction of a spatial calculation model of a steel hall, performing static calculations and dimensioning of selected elements.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>knowledge of the basics of metal structure design:
metal structures I and II</td></tr>
<tr><td>Assessment methods and criteria</td><td><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>project completion</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>test</td><td>60.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>1. Rykaluk K.: Zagadnienia stateczności konstrukcji metalowych, DWE, Wrocław, 2012

2. Pałkowski Sz.: Konstrukcje stalowe. Wybrane zagadnienia obliczania i projektowania. PWN, Warszawa 2010.

3. Pałkowski Sz.: Podstawy stateczności stalowych konstrukcji prętowych. Wydawnictwo Uczelniane Politechniki Koszalińskiej, Koszalin 2016.

4. Falborski T., Knabe W., Perliński A., Urbańska-Galewska E.: Wybrane zagadnienia projektowania stalowych konstrukcji prętowych z wykorzystaniem programu Autodesk Robot Structural Analysis. Wydawnictwo PG, Gdańsk 2019.

5. PN-EN 1993-1-1 Eurokod 3: Projektowanie konstrukcji stalowych. Część 1-1: Reguły ogólne i reguły dla budynków

6. PN-EN 1993-1-6 Eurokod 3: Projektowanie konstrukcji stalowych. Część 1-6: Wytrzymałość i stateczność konstrukcji powłokowych

7. PN-EN 1993-1-8 Eurokod 3: Projektowanie konstrukcji stalowych. Część 1-8: Projektowanie węzłów

8. PN-90/B-03200 Konstrukcje stalowe. Obliczenia statyczne i projektowanie</td></tr>
<tr><td>Supplementary literature</td><td>Current research issues concerning the load-bearing capacity of steel hall structural elements on the website of the Gdańsk University of Technology library</td></tr>
<tr><td>eResources addresses</td><td>Supplementary
https://pg.edu.pl/biblioteka-pg - database of scientific articles</td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. present the deformation and internal forces of a computer model of a steel hall

2. compare the results of static calculations for 2D and spatial models

3. How to determine the buckling lengths of steel hall elements</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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