GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Steel Structures I, PG_00064562		
Field of study	Civil Engineering		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2026/2027
Education level	first-cycle studies	Subject group	
Mode of study	Part-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	5	ECTS credits	6.0
Learning profile	general academic profile	Assessment form	exam
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		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	20.0	10.0	0.0	10.0	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	0.0	0.0	40

Subject objectives

Introduction to the production and properties of steel and principles of basic steel members and joints structural design.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U04] Reads and prepares construction documentation (including drawings, graphic documentation in the CAD environment), efficiently uses maps as well as architectural, construction and geodetic drawings.	Knows the main principles of describing steel elements and their connections in construction drawings.	[SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
[K6_W03] Demonstrate knowledge and understanding of the processes, established standards and design methods in the civil engineering subject area and of their limitations.	Knows and is able to use dimensioning procedures specified in standards for the design of steel structures.	[SW1] Assessment of factual knowledge
[K6_U03] Design engineering objects and details, processes and engineering systems by applying appropriate standards and methods of design.	Is able to design simple structural elements and their connections according to appropriate standards and methods.	[SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject [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).	Knows the steel production process and its properties. Knows the product range of steel structures.	[SW1] Assessment of factual knowledge

Subject contents

Course content – lecture

History of building steel structures developement. Production and properties of steel. Steel grades and its designations. Production of steel profiles and other steel materials. Limit States in steel structures design. Bolted and riveted joints. Welded joints. Welding methods, welding defects and NDT. Steel sections classification. Tension members. Uniaxial and biaxial bending of steel. Plate girders. Axially and eccentrically compressed coluns. Joins xeULS and SLS. Bolt and welded connections. Steel beams and columns. Beam and column joints.

Course content – exercises

Section classes. Steel tension member. Hole influence on section capacity. Axially compressed steel members. Bending of steel member. Shearing of steel member. Bolt joints. Welded joints.

Course content – project

Design of a structural system consisting of a column and a steel beam.

Design of the connection of steel elements.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written lecture examination	60.0%	40.0%
written tutorial test	60.0%	40.0%
design work	60.0%	20.0%

Recommended reading

Basic literature

1. Praca zbiorowa: *Budownictwo ogólne. Tom 5*, Arkady, Warszawa 2010

2. Łubiński M., Filipowicz A., Żółtowski W.: *Konstrukcje metalowe. Część 1.* Arkady, Warszawa 2000.

3. Rykaluk K.: *Konstrukcje stalowe.* Dolnośląskie Wydawnictwo Pedagogiczne, Wrocław 2001.

4. Goczek J., Supeł Ł., Gajdzicki M.:*Przykłady obliczeń konstrukcji stalowych*, Wydawnictwo PŁ, Łódź 2010

5. 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

6. 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

7. PN-EN 1993-1-1 *Eurocode 3: Design of steel structures. Part 1-1: General rules and rules for buildings*

8. PN-EN 1993-1-8 *Eurocode 3: Design of steel structures. Part 1-8: Design of joints*

Supplementary literature

1. Bogucki W., Żyburtowicz M.: *Tablice do projektowania konstrukcji metalowych*. Arkady, Warszawa 2007.

eResources addresses

Example issues/ example questions/ tasks being completed	1. ULS and SLS verification of the simply supported beam made of hot-rolled I-section. 2. ULS verification of the axialy compressed RHS column. 3. ULS verification of the overlapping bolted joint of three flat bars. 4. ULS verification of the welded joint between the cantilever beam and column.
Practical activites within the subject	Not applicable

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