GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Complex steel structures, PG_00041057
Field of study	Complex steel structures

Date of commencement of studies	October 2025	Academic year of realisation of subject	2025/2026
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	English
Semester of study	1	ECTS credits	4.0
Learning profile		Assessment form	assessment

Conducting unit	Department of Engineering Structures -> Faculty of Civil and Environmental Engineering -> Wydziały Politechniki Gdańskiej
Name and surname of lecturer (lecturers)	Subject supervisor — dr inż. Aleksander Perliński Teachers

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	15.0	0.0	60
	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	60	5.0	35.0	100

Subject objectives	Knowledge and abilities upgrade connected with analysis and design of complex steel structures. Introduction to rules and methods related to fabrication, assembly and strengthening of steel structures.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_W02] knows principles of analysis, design and dimensioning of complex constructions and its elements	Knows principles of design related to steel tall buildings, complex lattice structures, steel shell structures, masts, towers and chimneys. Knows methods of fabrication and assembly of metal structures. Knows principles of steel structure strengthening.	[SW1] Ocena wiedzy faktograficznej
	[K7_W04] has knowledge on advanced strength of materials, modeling and optimisation of materials and constructions; has knowledge of fundamentals of Finite Element Method and general nonlinear analysis of engineering constructions and systems	Knows principles of steel structures stability analysis using computer methods	[SW1] Ocena wiedzy faktograficznej
	[K7_W14] knows and applies building codes and obeys the Construction Law; has knowledge on environmetal impact of investment realisation	Knows and uses codes form Eurocode 3 series, in particular Parts: 1-1, 1-5 and 1-8	[SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym
	[K7_U02] can design and dimension complex steel, concrete (including reinforced), wood and masonry constructions and its details	Can design steel floor beam, section class 4 plate girder and battened build-up column.	[SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu [SU1] Ocena realizacji zadania

Subject contents	Course content – lecture Lectures: Plate girders and elements in section class 4. Multi-storey steel frame buildings. Structural lattices. Trusses of tubular sections. Advanced stability of steel structures. Masts, towers and chimneys. Dynamics and fatigue of steel structures. Steel shell structures. Structures of aluminium alloys. Manufacturing of steel structures. Assembly of steel structures. Refurbishment and strengthening of steel structures Tutorials and project: Design of a steel floor beam. Design of a plate girder in section class 4. Design of a steel built-up column.
Prerequisites and co-requisites	

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written tutorial test	60.0%	50.0%
	written lecture test	60.0%	50.0%

Recommended reading	Basic literature	1. PN-EN 1993-1-1 *Eurocode 3: Design of steel structures. Part 1-1: General rules and rules for buildings* 2. PN-EN 1993-1-5 *Eurocode 3: Design of steel structures. Part 1-8: Plated structural elements* 3. PN-EN 1993-1-8 *Eurocode 3: Design of steel structures. Part 1-8: Design of joints* 4. Beg D. et al. *Design of plated structures*, ECCS, Ernst und Sohn, Berlin 2010 5. Kozłowski A. et al. *Konstrukcje stalowe. Przykłady obliczeń według PN-EN 1993-1. Część druga. Stropy i pomosty,* Oficyna Wydawnicza PRz, Rzeszów 2011 6. Group of Authors: *Budownictwo ogólne. Tom 5*, Arkady, Warszawa 2010 7. Ziółko J.: *Zbiorniki metalowe na gazy i ciecze*, Wydawnictwo Arkady, Warszawa 1986 8. Ziółko J., Orlik G.: *Montaż konstrukcji stalowych*, Wydawnictwo Arkady, Warszawa 1980 9. Łubiński M., Żółtowski W.: *Konstrukcje metalowe. Cześć II*, Wydawnictwo Arkady, Warszawa 2007
	Supplementary literature	1. Kozłowski A. et al. *Konstrukcje stalowe. Przykłady obliczeń według PN-EN 1993-1. Część pierwsza. Wybrane elementy i połaczenia,* Oficyna Wydawnicza PRz, Rzeszów 2009 2. Łubiński M., Filipowicz A., Żółtowski W.: *Konstrukcje metalowe. Cześć I*, Wydawnictwo Arkady, Warszawa 2000
	eResources addresses	

Example issues/ example questions/ tasks being completed	Design of plate girder in section class 4 with transverse stiffeners. Design of axially compressed buttened built-up column consisting of two channel chords.
Practical activites within the subject	Not applicable

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