



Subject card

Subject name and code	Complex steel structures, PG_00041057						
Field of study	Civil Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2022/2023		
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	general academic profile	Assessment form			assessment		
Conducting unit	Department of Metal Structures -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Aleksander Perliński					
	Teachers	dr inż. Aleksander Perliński prof. dr hab. inż. Robert Jankowski dr hab. inż. Piotr Iwicki dr inż. Natalia Korcz-Konkol					
Lesson types and methods of instruction	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_W14] knows and applies building codes and obeys the Construction Law; has knowledge on environmental impact of investment realisation	Knows and uses codes form Eurocode 3 series, in particular Parts: 1-1, 1-5 and 1-8			[SW3] Assessment of knowledge contained in written work and projects		
	[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] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment		
	[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] Assessment of factual knowledge		
	[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] Assessment of factual knowledge		

Subject contents	<p>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</p> <p>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.</p>											
Prerequisites and co-requisites												
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="453 396 794 427">Subject passing criteria</th> <th data-bbox="799 396 1141 427">Passing threshold</th> <th data-bbox="1145 396 1492 427">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="453 434 794 465">written tutorial test</td> <td data-bbox="799 434 1141 465">60.0%</td> <td data-bbox="1145 434 1492 465">50.0%</td> </tr> <tr> <td data-bbox="453 472 794 504">written lecture test</td> <td data-bbox="799 472 1141 504">60.0%</td> <td data-bbox="1145 472 1492 504">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	written tutorial test	60.0%	50.0%	written lecture test	60.0%	50.0%
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Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. PN-EN 1993-1-1 <i>Eurocode 3: Design of steel structures. Part 1-1: General rules and rules for buildings</i></li> <li>2. PN-EN 1993-1-5 <i>Eurocode 3: Design of steel structures. Part 1-5: Plated structural elements</i></li> <li>3. PN-EN 1993-1-8 <i>Eurocode 3: Design of steel structures. Part 1-8: Design of joints</i></li> <li>4. Beg D. et al. <i>Design of plated structures</i>, ECCS, Ernst und Sohn, Berlin 2010</li> <li>5. Kozłowski A. et al. <i>Konstrukcje stalowe. Przykłady obliczeń według PN-EN 1993-1. Część druga. Stropy i pomosty</i>, Oficyna Wydawnicza PRz, Rzeszów 2011</li> <li>6. Group of Authors: <i>Budownictwo ogólne. Tom 5</i>, Arkady, Warszawa 2010</li> <li>7. Ziółko J.: <i>Zbiorniki metalowe na gazy i ciecze</i>, Wydawnictwo Arkady, Warszawa 1986</li> <li>8. Ziółko J., Orlik G.: <i>Montaż konstrukcji stalowych</i>, Wydawnictwo Arkady, Warszawa 1980</li> <li>9. Łubiński M., Żółtowski W.: <i>Konstrukcje metalowe. Część II</i>, Wydawnictwo Arkady, Warszawa 2007</li> </ol>										
	Supplementary literature	<ol style="list-style-type: none"> <li>1. Kozłowski A. et al. <i>Konstrukcje stalowe. Przykłady obliczeń według PN-EN 1993-1. Część pierwsza. Wybrane elementy i połączenia</i>, Oficyna Wydawnicza PRz, Rzeszów 2009</li> <li>2. Łubiński M., Filipowicz A., Żółtowski W.: <i>Konstrukcje metalowe. Część I</i>, Wydawnictwo Arkady, Warszawa 2000</li> </ol>										
	eResources addresses	Adresy na platformie eNauczanie:										
Example issues/ example questions/ tasks being completed	<p>Design of plate girder in section class 4 with transverse stiffeners.</p> <p>Design of axially compressed buttended built-up column consisting of two channel chords.</p>											
Work placement	Not applicable											