



Subject card

Subject name and code	LIGHT MATAL STRUCTURES, PG_00042239						
Field of study	Civil Engineering						
Date of commencement of studies	February 2025		Academic year of realisation of subject		2025/2026		
Education level	second-cycle studies		Subject group		Optional subject group 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		Polish		
Semester of study	2		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Department of Metal Structures -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Elżbieta Urbańska-Galewska				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	0.0	0.0	45
	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	45		5.0		25.0	75
Subject objectives	To acquaint students with the principles of designing steel structures made of cold-bent sections, plate girders with profiled webs, castellated beams and aluminum sections						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W14] knows and applies building codes and obeys the Construction Law; has knowledge on environmetal impact of investment realisation		The student knows standards for the design of cold-bent steel structures and aluminum structures		[SW1] Assessment of factual knowledge		
	[K7_U02] can design and dimension complex steel, concrete (including reinforced), wood and masonry constructions and its details		The student can design elements of cold-formed sections		[SU1] Assessment of task fulfilment		
	[K7_W02] knows principles of analysis, design and dimensioning of complex constructions and its elements		The student knows the principles of advanced analysis of light metal structures (including elements made of cold-fold sections) and aluminum		[SW1] Assessment of factual knowledge		

Subject contents	<p>Content of lectures:</p> <p>Definition of light metal structures, scope of the subject</p> <p>Theoretical basis of cold formed sections design.</p> <p>Bearing capacity of cold-formed elements under compression and bending</p> <p>Connectors and connections in structures with cold-formed profiles.</p> <p>Stress skin design.</p> <p>Structural systems with cold formed profiles.</p> <p>Roof renovations using light steel construction</p> <p>Plates with corrugated webs. Castellated beams.</p> <p>Aluminum structures.</p> <p>Content of exercises:</p> <p>General rules in accordance with EN 1993-1-3</p> <p>Idealized cross-section (working example)</p> <p>Rules for distortional buckling calculation (working example)</p> <p>Axial compression, tension and bending resistance calculations (working examples)</p> <p>Shear force (working example)</p> <p>Local transverse forces (working example)</p> <p>Combined tension and bending</p> <p>Working example on purlin connected to the roof sheathing by self-drilling screw</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exam	60.0%	60.0%
	Colloquium	60.0%	40.0%
Recommended reading	<p>Basic literature</p> <ol style="list-style-type: none"> 1. Bródka J., Broniewicz M., Giżejowski M.: <i>Kształtowniki gięte - Poradnik projektanta</i>, Polskie Wydawnictwo Techniczne, Rzeszów, 2006. 2. Bródka J., Garncarek R., Miłaczewski K.: <i>Blachy faldowe w budownictwie stalowym</i>, Arkady, Warszawa, 1999. 3. Goczek J., Supel Ł.: <i>Kształtowniki gięte w obudowie hal</i>, Wydawnictwo Politechniki Łódzkiej, Łódź, 2007. 4. PN-EN 1993-1-3 Eurokod 3: Projektowanie konstrukcji Stalowych. Część 1-3: Reguły ogólne dla konstrukcji z kształtowników i blach profilowanych na zimno. 		

	Supplementary literature	Gwóźdź M.: Stany graniczne konstrukcji aluminiowych. Wydawnictwo Politechnika Krakowska , Kraków 2007.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	<p>Explain with a sketch what the reinforcement effect is and what parameters affect the final result. Explain the concept of distortion instability</p> <p>1. Check the compresion resistance of thin-walled element made out of cold-formed C-section.</p> <p>2. Check the bending resistance of thin-walled element made out of cold-formed Z-section.</p> <p>3. Check the sher resistance of thin-walled element made out of cold-formed SIGMA-section.</p>	
Work placement	Not applicable	

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