



Subject card

Subject name and code	, PG_00071534						
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		
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		2.0		
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. Marcin Abramski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	15.0	0.0	0.0	0.0	15
	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	15		0.0		0.0	15
Subject objectives	Conceptual design of innovative, unconventional steel and concrete connections in composite structures						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W15] has deep and adequate knowledge of civil engineering, within offered specialization and profile		Development of a design concept for selected types of innovative steel and concrete connections in composite beams		[SW3] Assessment of knowledge contained in written work and projects		
	[K7_U15] has advanced skills in civil engineering within offered specialization/profile		Computational verification of the developed design concept for selected types of innovative steel-concrete connections in composite beams based on the results of experimental destructive tests of these connections		[SU1] Assessment of task fulfilment		
Subject contents	Course content – exercises <ol style="list-style-type: none">1. Researching the technical literature for contemporary methods of connecting steel and concrete in composite beam cross-sections.2. Searching for longitudinal shear design methods for innovative types of connections between the steel web and the concrete slab of a composite beam in the guidelines for the design of steel-concrete composite structures and in the scientific literature.3. Identification of failure mechanisms for innovative types of steel web-to-concrete slab connections in composite beams subjected to experimental destructive testing.4. Development of a concept for calculating the longitudinal shear capacity of selected innovative types of connections between a steel web and a concrete slab of a composite beam.						
Prerequisites and co-requisites							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Dimensioning concept of connection no. 1 - compliance with experiment: +/- 20%	100.0%	20.0%
	Dimensioning concept of connection no. 2 - compliance with experiment: +/- 20%	100.0%	20.0%
	Dimensioning concept of connection no. 3 - compliance with experiment: +/- 20%	100.0%	20.0%
	Dimensioning concept of connection no. 4 - compliance with experiment: +/- 20%	100.0%	20.0%
	Dimensioning concept of connection no. 5 - compliance with experiment: +/- 20%	100.0%	20.0%
Recommended reading	Basic literature	<p>Eurocode 4: Design of composite steel and concrete structures Part 1-1: General rules and rules for buildings, 2004.</p> <p>Deutsches Institut für Bautechnik (DIBt), General building authority approval for composite steel beams with shear connector strips in clothoid and puzzle shape, Berlin, 2023.</p> <p>D. Krystkiewicz, M. Bednarski, Unconventional methods of steelconcrete composite connection: experimental investigations, Gdańsk, 2012.</p> <p>M. Abramski, Unconventional methods of shear connection between steel and concrete in experimental investigation, in: Proceedings of the Wrocław Bridge Days 2012: Durability of Bridge Structures, Wrocław, 2012: pp. 427435.</p> <p>K. Meller, Experimental tests connected with unconventional ways of steel web and concrete slab composite connection, Gdańsk, 2013.</p> <p>U. Breuninger, U. Kuhlmann, Tragverhalten und Tragfähigkeit liegender Kopfbolzendübel unter Längsschubbeanspruchung, Stahlbau 70 (2001) 835845. https://doi.org/10.1002/stab.200102810.</p>	
	Supplementary literature	<p>V. Schmitt, G. Seidl, M. Hever, C. Zapfe, Verbundbrücke Pöcking - Innovative VFT-Träger mit Betondübeln, Stahlbau 73 (2004) 387393. https://doi.org/10.1002/stab.200490108.</p> <p>G. Seidl, A. Braun, VFT-WIB-Brücke bei Vigaun -Verbundbrücke mit externer Bewehrung, Stahlbau 78 (2009) 8693. https://doi.org/10.1002/stab.200910009.</p> <p>W. Lorenc, T. Kolakowski, A. Hukowicz, G. Seidl, Verbundbrücke bei Elbląg: Weiterentwicklung der VFT-WIB-Bauweise, Stahlbau 86 (2017) 167174. https://doi.org/10.1002/stab.201710463.</p> <p>M. Kożuch, Modeling of the Steel Part of MCL-Shaped Composite Dowel (CD) Connectors and Methodology for Static Analysis of Hybrid SteelConcrete Beams, Wrocław, 2025.</p>	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Practical activities within the subject	Not applicable		

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