



Subject card

Subject name and code	Fundamentals of calculations and shaping of bridge structures, PG_00044279						
Field of study	Civil Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2024/2025		
Education level	first-cycle studies	Subject group			Optional subject group		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	4	Language of instruction			Polish		
Semester of study	7	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Railway Engineering -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		mgr inż. Maciej Malinowski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	30.0	0.0	0.0	0.0	30
	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	30		5.0		15.0	50
Subject objectives	presentation and teaching of the principles of shaping, modeling, construction and dimensioning of basic types of bridge structures and their structural elements						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U07] Can design and properly dimension basic elements of construction or basic foundations of general, hydrotechnical and bridge constructions		Ability to design and dimension basic bridge elements				
	[K6_W09] knows the principles of determining of loads acting on basic constructions (e.g. general, industrial, bridge, water, marine, transport objects) and rules of its constructing		Ability to determine bridge loads and the rules of their construction				
Subject contents	<ol style="list-style-type: none">Types of bridge static schemes: beam bridges, slab bridges, truss bridges, as well as arch, frame, suspension and cable-stayed bridgesMethods of modelling. Analytical methods. Numerical methods - FEM.Bridge loadings. Static and dynamic loadings. Imperfections. Repeated loads.Examples of bridges modelling and bridges details.Comparison between bridge superstructures with different levels of digitizing a static model of the railway bridge.Elements of calculation and design bridges for example a composite bridge.						
Prerequisites and co-requisites	Strength of materials.						
	Building mechanics.						
	Basics of bridge engineering						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	design exercise		0.0%		100.0%		

Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Malinowski M, Auxiliary materials for the shaping, design and calculation of bridge structures electronic version made available to students 2. Malinowski M, Szafrński M.: Elements of the road design, freestanding composite bridge electronic version made available to students
	Supplementary literature	<ol style="list-style-type: none"> 1. Rzyński A., Wołowicki W., Skarzewski J., Karlikowski J.: <i>Mosty stalowe</i>, PWN, Warszawa Poznań, 1984. 2. Szczygieł J.: <i>Mosty z betonu zbrojonego i sprężonego</i>. WKiŁ, Warszawa 1974 (1972). 3. Karlikowski J., Sturzbecher K.: <i>Mosty stalowe. Mosty belkowe i zespolone. Przewodnik do ćwiczeń projektowych</i> Politechnika Poznańska, Poznań, 2003. 4. Karlikowski J., Madaj A., Wołowicki W.: <i>Mostowe konstrukcje zespolone stalowo-betonowe</i>. WKiŁ, Warszawa 2007r. 5. Czudek H.: <i>Podstawy mostownictwa metalowego</i>, Politechnika Warszawska, Warszawa, 1997. 6. Hydzik J.: <i>Mosty kolejowe</i>, WKiŁ, Warszawa, 1986. 7. Danielski L.: <i>Mosty metalowe</i>, Politechnika Wroclawska, Wroclaw, 1983. 8. Cholewo J., Sznurowski M.: <i>Mosty kolejowe i fundamentowanie</i>, WKiŁ, Warszawa, 1965. 9. Korelewski J.: <i>Mosty stalowe</i>, Politechnika Krakowska, Kraków, 1980. 10. Szelągowski F.: <i>Mosty metalowe</i>, WKiŁ, Warszawa, 1966. 11. Pszenicki A.: <i>Mosty stalowe nitowane</i>, Wydawnictwa Komunikacyjne, Warszawa, 1954. 12. Leonhardt F.: <i>Podstawy budowy mostów betonowych</i>. WKiŁ, Warszawa 1982. 13. Madaj A., Wołowicki W.: <i>Mosty betonowe</i>. WKiŁ, Warszawa 1998. 14. Madaj A., Wołowicki W.: <i>Budowa i utrzymanie mostów</i>. WKiŁ, Warszawa 1995. 15. Furtak K.: <i>Mosty Zespolone</i>. PWN, Warszawa 1999. 16. Siwowski T.: <i>Projektowanie mostów według Eurokodów</i>. Elamed 2016. 17. Siwowski T.: <i>Zastosowanie Eurokodów w projektowaniu mostów</i>. Oficyna Wydawnicza Politechniki Rzeszowskiej, 2016. 18. Siwowski T., Turoń B.: <i>Projektowanie mostów zespolonych według Eurokodu 4</i>. Oficyna Wydawnicza Politechniki Rzeszowskiej, 2016. 19. Karlikowski J., Madaj A., Wołowicki W.: <i>Mosty zespolone stalowo-betonowe. Zasady projektowania wg PN-EN 1994-2</i>. WKiŁ 2016. 20. Machelski Cz.: <i>Ruhome obciążenia obiektów mostowych</i>. Dolnośląskie Wydawnictwo Edukacyjne 2015. 21. Bień J.: <i>Uszkodzenia i diagnostyka obiektów mostowych</i>. WKiŁ, Warszawa 2010.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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