



Subject card

Subject name and code	Maintenance and Diagnostics of Bridges, PG_00041245						
Field of study	Civil Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
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	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Katedra Wytrzymałości Materiałów -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Mikołaj Miśkiewicz				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	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	The aim of the course is to familiarize students with the principles of maintaining and diagnostics of bridges.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_U16] is able to estimate the technical condition of engineering object; can interpret the results of constructions and materials examination;	The student is able to perform periodic inspection of the bridge.			[SU1] Assessment of task fulfilment		
	[K7_W13] has knowledge on state of the art methods on knowledge acquisition, filtration, processing and analysis	The student has expanded knowledge of measurement methods and interpretation of results.			[SW2] Assessment of knowledge contained in presentation		
	[K7_W10] knows modern building materials as well as technologies and methods of its manufacturing and production of construction elements	The student is able to select materials to repair bridges.			[SW3] Assessment of knowledge contained in written work and projects		
	[K7_U11] is able to plan and execute laboratory experiments to evaluate quality of construction materials and to determine strength of construction elements	The student is able to perform diagnostic tests and interpret results.			[SU2] Assessment of ability to analyse information		
	[K7_W16] knows methods of diagnostics of engineering objects, has knowledge about different kinds of defects in constructions and its reasons; knows means of fixing and reinforcing of constructions.	The student has expanded knowledge of measurement methods and interpretation of results.			[SW1] Assessment of factual knowledge		

Subject contents	<p>Lecture.</p> <ol style="list-style-type: none"> 1. Basic problems of bridge maintenance. 2. Damages and failures of engineering objects 3. Inspections of bridge structures. 4. Exploitation of bridge structures. 5. Maintenance of road and rail engineering facilities. 6. Diagnostics of engineering structures. 7. Modernization of engineering facilities. <p>Exercises.</p> <ol style="list-style-type: none"> 1. Presentation and use of diagnostic methods 2. Inspection of the bridge 3. Assessment of the load capacity of the selected engineering object 		
Prerequisites and co-requisites	Required completion of the course "Bridges and tunnels", , "Mosty stalowe", "Mosty betonowe" (1st degree)		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Execution of the extended bridge inspection with the load capacity assessment	60.0%	50.0%
	Answers to questions about the content presented during the lecture.	60.0%	50.0%
Recommended reading	<p>Basic literature</p> <ol style="list-style-type: none"> 1. A. Jarominiak, Podstawy utrzymania mostów, OWPRz, Rzeszów, 1999. 2. A. Madaj, W. Wolowicki, Budowa i utrzymanie mostów. WKŁ, Warszawa, 2001. 3. J. Bień, Uszkodzenia i Diagnostyka Obiektów Mostowych, WKŁ, Warszawa, 2010. 4. H. Czudek, A. Wysokowski: Trwałość mostów drogowych. WKŁ, Warszawa, 2005. 5. GDDKiA, Instrukcje przeprowadzania przeglądów drogowych obiektów inżynierskich. Zarządzenie nr 14 z dnia 7 lipca 2005 r. 6. PKP PLK, Instrukcja utrzymania kolejowych obiektów inżynierskich na liniach kolejowych do prędkości 200/250 km/h, Id-16, 2014 		
	<p>Supplementary literature</p> <p>K. Flaga, Diagnostyka obiektów mostowych z betonu. Mosty, Warszawa, 2015. E. Zabawa, Newralgiczny element. Utrzymanie drogowych obiektów mostowych. Autostrady, 2012. A. Jarominiak, A. Rosset, Katastrofy i awarie mostów. WKŁ, Warszawa, 1986</p>		
	<p>eResources addresses</p> <p>Adresy na platformie eNauczanie: Eksploatacja i diagnostyka mostów (r.a. 2023/24) - Moodle ID: 34034 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34034</p>		
Example issues/ example questions/ tasks being completed	<p>What is the assessment of the suitability for use of a bridges? What factors have influence on the technical condition of the bridges? What are the strategies of managing the engineering infrastructures? List the strain measurement methods used in the diagnostics of the engineering infrastructures.</p>		
Work placement	Not applicable		