



## Subject card

Subject name and code	Rail transport infrastructure, PG_00044608						
Field of study	Transport						
Date of commencement of studies	October 2022		Academic year of realisation of subject			2023/2024	
Education level	first-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	2		Language of instruction			Polish	
Semester of study	4		ECTS credits			4.0	
Learning profile	general academic profile		Assessment form			exam	
Conducting unit	Department of Railway Engineering -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Sławomir Grulkowski				
	Teachers		dr inż. Sławomir Grulkowski  dr inż. Michał Urbaniak				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	30.0	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	The aim of the course is to acquaint the student with the elements of rail transport infrastructure, which is the provision of railway and tramway. Principles of construction, operation and design of infrastructure						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K6_W12] has basic knowledge of the design and construction of transport infrastructure		Student names and identifies the infrastructural elements of the rail transport. Student describes the construction of the rail, tram and metro road. Student is able to classify the stations, junctions, lines and operation points. Student calculates the amounts of the elements necessary for building the rail surface. Student designs simple geometric elements of the railway line. Student is able to indicate the differences in the design regulations for railway, metro and tram. Student defines the requirements for building the infrastructure of the rail transport of any size and any purpose.			[SW1] Assessment of factual knowledge	
	[K6_U10] able to carry out simple engineering tasks related to the construction and operation of a selected element of the transport system, select the right methods and tools, select the right technical parameters for an object to be designed including economic and environmental aspects		Student is able to determine the parameters of simple geometries railway and tram lines			[SU4] Assessment of ability to use methods and tools	

Subject contents	LECTURE Railway lines and tracks categories and classes. Infrastructure of the railroads. Track structure and turnouts loading, construction, diagnostics and maintenance. Unconventional track structures. Forming of the system and profile of the railroad. High-speed lines. Rail engineering structures. Possibilities of the reduction of vibroacoustic impact of the rail transport on environment. Rail transport infrastructure in the city and agglomeration tram, metro, fast city and regional trains. Classifications of the operation points. Railway stations and junctions. Unconventional trains (cable car, magnetic levitation trains). Railway stations. Terminals of the multimodal transport.		
	TUTORIALS Determination of the appropriate amounts of the materials used for railway line building. Calculations of the size and capacity of passenger and freight railway stations. Operation of railway station.		
	PROJECT Project of the arc of the railway line. Project of the part of the tram line		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	tutorials	100.0%	25.0%
	project	100.0%	35.0%
	lecture	60.0%	40.0%
Recommended reading	Basic literature	1. Basiewicz T., Gołaszewski A., Rudziński L.; Infrastruktura transportu. Politechnika Warszawska, 2007 2. Towpik K.; Infrastruktura transportu kolejowego. Politechnika Warszawska, 2004 3. Regulation of Minister of Transport and Maritime Economy of 10 September 1998 on the technical requirements to be met by railway structures and their location. (Dz. U. No 151/1998) 4. Technical Guidelines for the design, construction and maintenance of tram tracks. Ministry of Communications. Warsaw 1983 5. Chelmecki W. Stacje kolejowe cz. 1 i 2. Wyd. Politechniki. Krak. 1997 i 2001 6. Grulkowski S., Kędra Z., Koc W., Nowakowski M., Drogi szynowe, Wyd. Polit. Gda., Gdańsk, 2013	
	Supplementary literature	1. Technika Transportu szynowego (magazine) 2. Infrastruktura transportu (magazine)	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Elements of a railway elements of subgrade railway turnouts		
Work placement	Not applicable		