



Subject card

Subject name and code	Railway construction II, PG_00044314						
Field of study	Civil Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2023/2024		
Education level	second-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	Part-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	2	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	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	10.0	0.0	0.0	10.0	0.0	20
	E-learning hours included: 0.0 Adresy na platformie eNauczanie:						
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	20	5.0		25.0		50
Subject objectives	Naming and identification of rail infrastructure. Description of the structure of rail road train, tram, subway. Classification of stations, nodes, lines, and other operating points. Calculating the number of elements of the construction of the rail surface. Design of simple geometric elements of the railway line. Identifying differences in design rules railways, subways and trams. Determination of requirements for the construction of rail transport infrastructure of all sizes and for various purposes						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_W08] has deep knowledge of railway track construction, including high speed railroads; design and renovation of railroads of complex geometry; has detailed knowledge about diagnostics of railroads, knows basics of railway traffic organisation and control	student has structured and theoretically founded knowledge in the construction of railways, including high speed rail and the design of complex geometries tracks and repair of railways; has detailed knowledge in the diagnosis of railways, knows the basics of organization and control railway traffic	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
	[K7_U13] can plan an optimal schedule of construction works, is able to use software for construction works planning; applies rules of management according to FIDIC; makes quality and marketing plan; make cost estimates of engineering (and special) works, taking into account the specific technologies	The student is able to determine the amount of materials needed to build a railway section; is able to plan the optimal schedule for the implementation of the project and select the appropriate set of machines	[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
	[K7_U09] is able to design railway tracks of complex geometry on sections and stations, both newly designed and renovated; can make a plan and perform diagnostic of railway track and to interpret its results, propose conclusions; can evaluate durability and reliability of railroad elements	The student is able to design complex systems to track geometric lines and railway stations, both new build and refurbishment; able to plan and perform diagnostic tests in the field of railways, to interpret the results of the research and draw conclusions supplies; able to assess the durability and reliability of the superstructure elements	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
Subject contents	<p>LECTURE</p> <p>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.</p> <p>TUTORIALS</p> <p>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.</p> <p>PROJECT</p> <p>Project of the arc of the railway line. Project of the part of the tram line</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	project	40.0%	45.0%
	lecture	60.0%	55.0%
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, 2001	
	Supplementary literature	1. Technika Transportu szynowego (magazine) 2. Infrastruktura transportu (magazine)	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Distribution of railway structures The components of rail Structural elements of the superstructure Principles of pavement structure Categories and classes of railway lines		
Work placement	Not applicable		