



Subject card

Subject name and code	Planning and designing rail transport infrastructure, PG_00051694						
Field of study	Transport						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	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			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Sławomir Grulkowski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	15.0	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 basic criteria for planning and locating rail transport infrastructure. An additional aim is to discuss the basic elements of designing geometric layouts of railway tracks						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W11] has basic knowledge of energy in transport		The student is able to identify the elements of the power industry in the infrastructure design process		[SW1] Assessment of factual knowledge		
	[K7_U14] able to solve detailed problems of transport infrastructure to an extent required of the specialty		The student is able to design simple elements of the network and track infrastructure		[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		
	[K7_W14] has advanced knowledge of transport infrastructure maintenance and management to an extent required of the specialty		The student is able to identify problematic elements of the infrastructure. He can find a way to improve the situation		[SW1] Assessment of factual knowledge		
Subject contents	Lecture						
	1. Preparation of investments - studies and design 2. International agreements and regulations 3. Requirements and their classification 4. Railway earthworks 5. The course of the line 6. Shaping geometric systems 7. Railway stations 8. Track connections 9. Functional diagrams 10. Crossroads of railroads with roads 11. Principles of designing devices for passenger transport						
	Project						
	1. Design of a fragment of a railway line 2. Project of a railway station 3. Railway crossing project						

Prerequisites and co-requisites	<p>Ability to name infrastructure elements</p> <p>Knowledge of the basic formulas for calculating the geometric parameters of the railway track</p> <p>Ability to interpret graphs from diagnostic measurements</p>		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project	100.0%	50.0%
	Test from the lecture	55.0%	50.0%
Recommended reading	Basic literature	<p>Massel A., Designing railway lines and stations, PKP Polskie Linie Kolejowe, Warsaw, 2010</p> <p>Detailed technical conditions for the modernization or construction of railway lines to the speed of V_{max} 200 km / h (for conventional rolling stock) / 250 km / h (for rolling stock with tilting body) - VOLUME I - RAILWAY - Annex ST-T1-A6 "Geometric arrangements tracks "(valid from 01/01/2018)</p> <p>Technical conditions for the maintenance of the surface on the railway lines Id-1 (D-1)</p> <p>Bałuch H., Optimization of track geometric systems, Transport and Communications Publishing Hous, 1983</p>	
	Supplementary literature	Bałuch H. Geometric systems of track connections, Transport and Communications Publishing House, 1983	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	<p>Lecture</p> <ol style="list-style-type: none"> 1. Which extremes are typically used for intermodal transport. Briefly describe 2. List the individual steps in the design of the railway route 3. Based on the drawing, determine the amount of track shift to the inside of the curve as a result of the elongation KP (drawing in the appendix) 4. What is an equivalent cant and excess cant 5 Explain the concept of useful track length <p>Design</p> <ol style="list-style-type: none"> 1. rules for calculating the longitudinal gradients of a railway track. 2. Analysis of train traffic resistance 3. Calculation of complex turnout systems. 4. Calculation of the braking mass of the train. 		
Work placement	Not applicable		