



Subject card

Subject name and code	, PG_00065227						
Field of study	Transport						
Date of commencement of studies	February 2024		Academic year of realisation of subject			2024/2025	
Education level	second-cycle studies		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	Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Sławomir Grulkowski				
	Teachers		dr inż. Kamila Szwackiewicz				
			dr inż. Sławomir Grulkowski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	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		0.0		0.0	45
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_U05] cooperates with other people in the implementation of team work, both as a leader and a team member, effectively achieving set goals		The student is able to identify the industries necessary to complete the task. Is able to determine the sequence of tasks when completing the project			[SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject	
	[K7_K01] recognizes the importance of knowledge related to the field of study in solving cognitive and practical problems		The student is able to design simple elements of the network and track infrastructure			[SK2] Assessment of progress of work [SK3] Assessment of ability to organize work [SK5] Assessment of ability to solve problems that arise in practice	
	[K7_W01] identifies in an in-depth way phenomena related to the field of study as well as theories describing them and possible methods of analyzing processes occurring in the life cycle of technical systems		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	Ability to name infrastructure elements Knowledge of the basic formulas for calculating the geometric parameters of the railway track Ability to interpret graphs from diagnostic measurements		
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	Massel A., Designing railway lines and stations, PKP Polskie Linie Kolejowe, Warsaw, 2010 Detailed technical conditions for the modernization or construction of railway lines to the speed of Vmax 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) Technical conditions for the maintenance of the surface on the railway lines Id-1 (D-1) Bałuch H., Optimization of track geometric systems, Transport and Communications Publishing Hous, 1983	
	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	Lecture 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 Design 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		