



Subject card

Subject name and code	Planning and designing rail transport infrastructure, PG_00051694						
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. Sławomir Grulkowski dr inż. Kamila Szwaczekiewicz					
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		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_U02] presents logical and solid arguments regarding the obtained results, through analysis, synthesis of information in various technical contexts, critically approaching their interpretation	The student is able to identify design problems and find correct solutions			[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools		
	[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			[SK5] Assessment of ability to solve problems that arise in practice [SK3] Assessment of ability to organize work [SK2] Assessment of progress of work		
	[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		
	[K7_K02] makes competent and ethical decisions, caring for the public interest and maintaining economic, social and environmental values	The student is able to identify social problems related to rail transport design and find safe solutions.			[SK3] Assessment of ability to organize work [SK5] Assessment of ability to solve problems that arise in practice		
	[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			[SU3] Assessment of ability to use knowledge gained from the subject [SU5] Assessment of ability to present the results of task		

Subject contents	<p>Lecture</p> <ol style="list-style-type: none"> 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 <p>Project</p> <ol style="list-style-type: none"> 1. Design of a fragment of a railway line 2. Project of a railway station 3. Railway crossing project <p>Laboratory</p> <ol style="list-style-type: none"> 1. The structure of the design office 2. Visit to the design office 											
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	<table border="1" data-bbox="448 1068 1497 1173"> <thead> <tr> <th data-bbox="448 1068 794 1104">Subject passing criteria</th> <th data-bbox="794 1068 1141 1104">Passing threshold</th> <th data-bbox="1141 1068 1497 1104">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 1104 794 1135">Project</td> <td data-bbox="794 1104 1141 1135">100.0%</td> <td data-bbox="1141 1104 1497 1135">50.0%</td> </tr> <tr> <td data-bbox="448 1135 794 1173">Test from the lecture</td> <td data-bbox="794 1135 1141 1173">55.0%</td> <td data-bbox="1141 1135 1497 1173">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Project	100.0%	50.0%	Test from the lecture	55.0%	50.0%
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Project	100.0%	50.0%										
Test from the lecture	55.0%	50.0%										
Recommended reading	<p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>	<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> <p>Bałuch H. Geometric systems of track connections, Transport and Communications Publishing House, 1983</p> <p>Adresy na platformie eNauczanie:</p>										

<p>Example issues/ example questions/ tasks being completed</p>	<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.
<p>Work placement</p>	<p>Not applicable</p>

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