GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Railways II, PG_00041396						
Field of study	Civil Engineering						
Date of commencement of studies	February 2023		Academic year of realisation of subject	2023/2024			
Education level	second-cycle studies		Subject group	Optional subject group 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	1		Language of instruction	Polish			
Semester of study	2		ECTS credits	5.0			
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 hab. inż. Piotr Chrostowski					
	Teachers						

Lesson types and methods of instruction							
	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	15.0	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	60.0	125

Subject objectives	
	The aim of the course is to deepen the knowledge and skills in designing complex geometric systems of railway lines. The design methodology is extended in relation to the engineering course with such elements as: nonlinear models in curvature distributions, modeling of the curvature distribution with optimization elements, assessment of the quality of geometric systems and assessment of their modification possibilities. The elements of the methodology of identifying existing geometric systems in local and global spatial reference systems are also discussed in detail.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U15] has advanced skills in civil engineering within offered specialization/profile	The student is able to design a complex geometrical system consisting of any chosen distribution of curvature. Is able to model the system due to the assumed kinematic parameters.	[SU1] Assessment of task fulfilment
[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 geometrical systems with the use of optimization elements. Can assess the system and propose the direction of changes in order to improve the operating parameters. The student understands the design methodology in local and global spatial reference systems.	[SU1] Assessment of task fulfilment
[K7_W15] has deep and adequate knowlege of civil engineering, within offered specialization and profile	The student has knowledge of the rail transport infrastructure and the basics of designing railway lines and station systems.	[SW1] Assessment of factual knowledge
[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 diagnistics of railroads, knows basics of railway traffic organisation and control	The student knows the methodology of designing geometric systems of the railway track. He knows the quality assessment criteria in terms of operational parameters. The student knows the geometric elements used in railways, appropriate for the design of complex geometric systems. He knows the necessary parameters and their values allowed by the relevant industry regulations.	[SW1] Assessment of factual knowledge

Subject contents

Characteristics of railway lines, main technical and operational parameters.Characteristics of mapping a railway track in plan, profile (vertical) and sections.Reference systems and the method of identifying the position of the track axis in space - global systems.geometric elements used in railroad design and their characteristics including basket curves containing nonlinear curvature distributions.Modeling of complex geometrical curvature, taking into account kinematic parameters.Methodology of shaping geometrical systems in a situational plan with full continuity at the level of ordinates, tangents and curvatureAssessment of geometric systems and the possibility of their modification.

Prerequisites and co-requisites

The student has knowledge related to railway infrastructure and the methodology of designing geometric systems at a basic level. He can work with a situational and altitude map, has skills in the basics of programming and numerical data processing using computer programs such as MS Excel, SciLab.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
test	50.0%	50.0%
project reports	50.0%	50.0%

Recommended reading

Basic literature	Not applicable.
Supplementary literature	Not applicable.
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

Characterize the basic elements of the railroad in a cross-section,Explain what the following processes are: adjustment of the track axis, modernization of the railway line, revitalization of the railway line,What is the inventory of the track axis in the global system (spatial reference system in a given country),List the basic geometric elements in the horizontal alignment and characterize the methodology of modeling the system based on the distribution of curvature.

Work placement

Not applicable