



Subject card

Subject name and code	Railways I, PG_00044193						
Field of study	Civil Engineering						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2023/2024		
Education level	first-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	Full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	5		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		prof. dr hab. inż. Eligiusz Mieloszyk				
	Teachers		dr inż. Michał Urbaniak				
			mgr inż. Piotr Omieczyski				
			mgr inż. Natalia Karkosińska-Brzozowska				
			prof. dr hab. inż. Eligiusz Mieloszyk				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0	0.0	30
	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	30		5.0		15.0	50
Subject objectives	The aim of the course is to present the structure of railways, the characteristics of the rail surface elements (rails, sleepers and ballast) and the basic rules of railway track designing.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W10] Has basic knowledge on design, construction and maintenance of roads and railroads		The student has the ability to distinguish the basic characteristic elements of railway track. The Student can interpret geometric and physical parameters describing geometric layout. The student can adjust construction of the railway track to a specific track class.				
	[K6_U13] knows principles of constrution of roads and railroads; can design a section of a road and railroad; can evaluate the technical condition of a road and railroad infrastructure		The student is able to design a simple geometric layout of a railway track in the plan - a section of a railway line. The student is able to adjust the acceptable parameters to the designed system of a specific category of railway line.				

Subject contents	Types of transport and place of railway transport;Contact of various types of transport with railway transport;Engineering structures on a railway (bridges, viaducts, tunnels, culverts);Connections of the issues of railway engineering with the following areas of knowledge: geotechnics, structural mechanics, geodesy, materials engineering, environmental engineering, mechanical engineering (vehicle mechanics and rolling stock), aerodynamics (rolling stock), electrical engineering and electronics (traction, rail traffic control);Basic concepts related to railway infrastructure;Classification of railway lines;Railway track surface elements;Railway line as a spatial curve;Principles of shaping the track geometry;Transition curves, including clothoid and its properties;Geometric layout of the track in the horizontal and vertical planes;Vehicle in a circular curve and transition curve;A rail on an elastic foundation loaded with concentrated force, used to measure the stiffness of a railway superstructure.		
Prerequisites and co-requisites	Not required		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Passing the lecture (test)	60.0%	40.0%
	Passing the exercises	60.0%	60.0%
Recommended reading	Basic literature	1. Bałuch H.: Układy geometryczne połączeń torów. WKŁ. Warszawa1989. 2. Bałuch M.: Podstawy dróg kolejowych. Politechnika Radomska2001. 3. Koc W.: Elementy teorii projektowania układów torowych.Politechnika Gdańska 2004. 4. Sysak J.: Drogi kolejowej. PWN,Warszawa 1986.5. Rozporządzenie ministra transportu i gospodarkimorskiej z dnia 10 września 1998 r. w sprawie warunków technicznych,jakim powinny odpowiadać budowle kolejowe i ich usytuowanie. Dz. U.z dnia 15 grudnia 1998. z późniejszymi zmianami 6. Id -1 Warunki techniczne utrzymania nawierzchni na liniach kolejowych Warszawa, 2005. 7. Grulkowski S., Kędra Z., Koc W., Nowakowski M.: Drogi szynowe. Wyd. Pol.Gdańskiej, Gdańsk 2013	
	Supplementary literature	1. Annex No. 1 to Resolution No. 1086/2017 of the Management Board of PKP Polskie Linie Kolejowe S.A. of November 13, 2017, Technical standards, Attachment ST1-T1-A6	
	eResources addresses	Adresy na platformie eNauczanie: Drogi Szynowe - Ćwiczenia 23/24 - Moodle ID: 30580 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30580 Drogi Szynowe - Ćwiczenia 23/24 - Moodle ID: 30580 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30580	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		