



Subject card

Subject name and code	, PG_00070553						
Field of study	Civil Engineering						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2025/2026		
Education level	first-cycle studies	Subject group			Optional subject group		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	4	Language of instruction			Polish		
Semester of study	8	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Transportation Engineering -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Sławomir Grulkowski					
	Teachers						
Lesson types	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						
	eNauczanie source address: <a href="https://enauczanie.pg.edu.pl/2025/course/view.php?id=4447">https://enauczanie.pg.edu.pl/2025/course/view.php?id=4447</a>						
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	0.0		0.0		30
Subject objectives	The aim of the course is to familiarize students with the principles of railway traffic on the railway network (lines and stations). The student learn about the classification of the elements of the railway network and railway traffic control systems. The basic principles for calculating of the movement resistance as well as a capacity problems of railway lines are discussed. The purpose and ways of implementation of the ERTMS are presented.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_U05] Conducts research (obtaining information, simulations, experimental methods) in the field of construction in order to solve specific tasks and report research results.	Ability to solve basic problems in the field of transport logistics and traffic engineering.			[SU1] Assessment of task fulfilment		
	[K6_W03] Demonstrate knowledge and understanding of the processes, established standards and design methods in the civil engineering subject area and of their limitations.	The student is able to interpret the basic principles of railway traffic engineering and adapt the solution of problems to these principles.			[SW1] Assessment of factual knowledge		
	[K6_K03] Can effectively, clearly and unambiguously convey information, describe activities and communicate their results/ outcomes to engineers or a wider audience using appropriate communication methods and tools.	Can identify places where traffic problems occur at a railway station			[SK4] Assessment of communication skills, including language correctness		
	[K6_K01] Is aware of the key aspects of professional, ethical and social responsibility related to management, business operation, decision making and opinion formulation in civil engineering.	Can analyze a problem in a multi-faceted way			[SK5] Assessment of ability to solve problems that arise in practice		
	[K6_K04] Engages in independent lifelong learning and individually follows the development of science and technology in the field of civil engineering.	The student is able to use simulation techniques			[SK2] Assessment of progress of work		

Subject contents	Course content – lecture Basic principles of the organization of a passenger rail transport. Basic principles of organization of freight transport. Combined transport. Railway network. Traffic posts. Railway stations and their classification. Overview of the traffic control systems. Railway station equipments. Automatic Block Signalling. Traffic safety control systems. European Train Control System (ETCS). The rules of railway signalling. Basic information about rolling stock and combining of trains. Traffic in the routes and in the station area. Scheduling railway traffic on the network. Timetables of trains. Graphs of the train traffic.		
	Course content – exercises The relationship between the railway infrastructure and the train traffic. Queuing model and its application to calculate the required number of track in a station. The capacity of railroads. The way of increasing of the capacity of railroads. Measures of efficiency of the traffic.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Practical exercise	50.0%	40.0%
	Lectures test	50.0%	60.0%
Recommended reading	Basic literature	1. Bergiel K., Karbowski H.: Automatyzacja prowadzenia pociągu. EMI-PRESS. Łódź 2005 2. Bogdaniuk B., Maszel A.: Podstawy transportu kolejowego. Wydawnictwo PG. Gdańsk 1999 3. Zalewski P., Siedlecki P., Drewnowski A.: Technologia transportu kolejowego. WKiŁ. Warszawa 2004	
	Supplementary literature	Not required	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Dimensioning and constructing a functional diagram of a node station		
Practical activities within the subject	Not applicable		

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