



Subject card

Subject name and code	URBAN RAIL TRANSIT SYSTEMS, PG_00041397						
Field of study	Civil Engineering						
Date of commencement of studies	February 2025	Academic year of realisation of subject			2025/2026		
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 inż. Jacek Szmagliński				
	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 prepare the student to planning and designing urban rail transport routes. The means of urban rail transport that will be discussed on the subject are tram, high-speed city rail, metro and other means of transport combining the features of the above. Technical requirements for pavement design and track geometry in Poland and around the world will be presented. Information on the location and design of tram stops, stations and integration nodes will be provided.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_U15] has advanced skills in civil engineering within offered specialization/profile	Is able to design a cross section of track surface and stops. Knows the rules of tram traffic control and other means of urban rail transport.			[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	Is able to design a fragment of a double-track tram road, a junction and a terminal. Can assess the condition of the track and the condition of its components.			[SU1] Assessment of task fulfilment		
	[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 diagnostics of railroads, knows basics of railway traffic organisation and control	Is able to develop rules for the integration of various transport modes.			[SW1] Assessment of factual knowledge		
	[K7_K03] can think and act creatively and enterprisingly and works for society	Understands the need for planning transport systems and can indicate the effects of planning decisions.			[SK5] Assessment of ability to solve problems that arise in practice		
[K7_W15] has deep and adequate knowledge of civil engineering, within offered specialization and profile	Knowledge of basic forms of urban rail transport.			[SW1] Assessment of factual knowledge			

Subject contents	<ol style="list-style-type: none"> 1. Rail City Transport - admission to lectures, 2. Description of vehicles and tram routes and high-speed city rail, 3. Description of vehicles and metro routes, two-system tram, pre-metro and fast tram, 4. Integration nodes - description of solutions and functional requirements, 5. Integration nodes - detailed technical solutions, 6. Designing of tram routes - horizontal geometry, 7. Tramway design - vertical and cross-sectional geometry, 8. Designing tram stops, 9. Construction of rail surfaces - ballast, 10. Construction of rail surfaces - ballastless, 11. Outdoor activities on the tracks, 12. Outdoor activities on the tram depot, 13. Tram switches - geometry, 14. Tram switches - controls, 15. Repetition of material. 											
Prerequisites and co-requisites	<p>Railroads</p> <p>Computer-aided designing</p>											
Assessment methods and criteria	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Subject passing criteria</th> <th style="width: 33%;">Passing threshold</th> <th style="width: 34%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>technical desing</td> <td>100.0%</td> <td>45.0%</td> </tr> <tr> <td>test</td> <td>60.0%</td> <td>55.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	technical desing	100.0%	45.0%	test	60.0%	55.0%
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technical desing	100.0%	45.0%										
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Recommended reading	Basic literature	<ul style="list-style-type: none"> • Kubalski J.: Komunikacja miejska. Tory tramwajowe. WKiŁ, Warszawa 1978. • Wesołowski J.: Miasto w ruchu. Instytut spraw Obywatelskich (internet), 2008 • Warunki techniczne jakim powinny odpowiadać linie metra i ich usytuowanie, Warszawa, 2007 • Podoski J.: Transport w miastach. WKiŁ, Warszawa, 1985 • Rozporządzenie Ministra Transportu i Gospodarki Morskiej z dnia 2 marca 1999 r. w sprawie warunków technicznych, jakim powinny odpowiadać drogi publiczne i ich usytuowanie. • Rozporządzenie Ministra Transportu i Gospodarki Morskiej z dnia 10 września 1998 r. w sprawie warunków technicznych, jakim powinny odpowiadać budowle kolejowe i ich usytuowanie. • Wytyczne techniczne projektowania budowy i utrzymania torów tramwajowych, MAGTiOŚ, Warszawa 1983. • Tymczasowe wytyczne do projektowania szybkiej komunikacji tramwajowej, MAGTiOŚ, Warszawa 1981 										
	Supplementary literature	<ul style="list-style-type: none"> • Wesołowski J.: Transport miejski. Instytut Spraw Obywatelskich (internet). • AUSFÜHRUNGSBESTIMMUNGEN ZUR EISENBahnVERORDNUNG (A B - E B V) • Track Design Handbook for Light Rail Transit Second Edition TCRP REPORT 155 • Verordnung über den Bau und Betrieb der Straßenbahnen 										
	eResources addresses	Adresy na platformie eNauczanie:										

<p>Example issues/ example questions/ tasks being completed</p>	<p>Test:</p> <ul style="list-style-type: none"> • describe the means of urban rail transport, • describe the basic parameters of integration nodes and integration methods, • describe the methods of tram street geometry design, • describe and draw typical cross-sections of track surface, • describe turnout control methods, • draw basic turnout structures. <p>Design:</p> <ul style="list-style-type: none"> • Create a concept of a two-track tram road with a branch and a limit switch, • perform calculations regarding geometry, • make technical drawings, situational plan, profile, construction cross-sections, system specification track, stakeout plan. • make a technical description.
<p>Work placement</p>	<p>Field exercises</p>

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