



Subject card

Subject name and code	Rail traffic control system, PG_00050391						
Field of study	Transport						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
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			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	dr inż. Sławomir Grulkowski					
	Teachers	dr inż. Sławomir Grulkowski					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	15.0	0.0	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		0.0		0.0	45
Subject objectives	The aim of the course is to provide information on rail traffic management systems, rail traffic control and safety devices and the basic principles of rail traffic management						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W13] has advanced knowledge of the design and management of transport systems to an extent required of the specialty		The student is able to interpret the diagrams of stations in the railway traffic control industry. Can design simple solutions at stations and railway crossings. Can interpret the contradictions of movement		[SW1] Assessment of factual knowledge		
	[K7_U13] able to solve detailed problems of transport systems to an extent required of the specialty		The student is able to interpret movement problems and find a solution. Can count the capacity of a section of a railway line and present conclusions. He knows the traffic control systems for local lines.		[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		
	[K7_W05] has basic knowledge of control in transport systems		The student is able to name the railway traffic control systems. Can interpret the current motor situation. Can name the devices involved in the control process and locate them in the field		[SW1] Assessment of factual knowledge		

Subject contents	<p>LECTURE</p> <p>Introductory information: General outline and control models, Outline of the structure of the railway network, outline of the organization of railway traffic, route and mileage Control circle and setting circle, description of the control process, Outline of the schematic plan and dependency table, Outline of the formal description of the control process Functional and technical classification, Safety, reliability, traffic efficiency. Standards and recommendations, evaluation indicators Railway signaling Outline of propulsion devices, key devices, semi-automatic linear blockade Relay devices at stations - executive systems Automatic line lock Level crossing Remote motion control Communication of information between track and vehicle Radio traffic control on lightly loaded lines European Train Control System Computer assisted traffic control</p> <p>PROJECT</p> <p>Design of the control system and dependence of a small railway station</p> <p>TUTORIALS</p> <p>Identification of contradictory / non-contradictory waveforms</p> <p>Calculation of bandwidth</p> <p>Simulation of the operation of a railway station</p>														
Prerequisites and co-requisites	<p>The student should know the railroad infrastructure, especially the structure of railway turnouts.</p> <p>The student should know the basic assumptions of railway traffic engineering</p>														
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="453 1247 794 1272">Subject passing criteria</th> <th data-bbox="799 1247 1141 1272">Passing threshold</th> <th data-bbox="1145 1247 1492 1272">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="453 1279 794 1330">general design of the railway station control system</td> <td data-bbox="799 1279 1141 1330">60.0%</td> <td data-bbox="1145 1279 1492 1330">30.0%</td> </tr> <tr> <td data-bbox="453 1337 794 1361">test</td> <td data-bbox="799 1337 1141 1361">60.0%</td> <td data-bbox="1145 1337 1492 1361">40.0%</td> </tr> <tr> <td data-bbox="453 1368 794 1393">solving a group of tasks</td> <td data-bbox="799 1368 1141 1393">60.0%</td> <td data-bbox="1145 1368 1492 1393">30.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	general design of the railway station control system	60.0%	30.0%	test	60.0%	40.0%	solving a group of tasks	60.0%	30.0%
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Recommended reading	<p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>	<p>Dąbrowa-Bajon M.: Podstawy sterowania ruchem kolejowym. Funkcje, wymagania, zarys techniki. OWPW, Warszawa 2007.</p> <p>Dyduch J., Kornaszewski M.: Systemy sterowania ruchem kolejowym. Wydawnictwo Politechniki Radomskiej, Radom 2007.</p> <p>Żurkowski A., Pawlik M., Ruch i przewozy kolejowe. Sterowanie ruchem. Warszawa 2010</p> <p>Dąbrowa-Bajon M.: Automatyzacja sterowania ruchem kolejowym. Tom 2. WPW, Warszawa 1983.</p> <p>Dąbrowa-Bajon M.: Automatyzacja sterowania ruchem na liniach kolejowych. WPW, Warszawa 1980.</p> <p>Adresy na platformie eNauczanie: Sterowanie ruchem kolejowym - 2T_II_SR - 2023/2024 - Moodle ID: 30682 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30682</p>													

<p>Example issues/ example questions/ tasks being completed</p>	<p>Design of a small station control system</p> <p>Calculation of the deployment of traffic control devices</p> <p>Bandwidth calculations</p> <p>Present the srk system as a Mealy automaton.</p> <p>Introduce the basic types of signaling devices.</p> <p>List the basic functions of the station lock.</p> <p>Describe how to implement a station blockade in key devices.</p> <p>Station operation simulator</p>
<p>Work placement</p>	<p>Not applicable</p>