GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Railway traffic control systems, PG_00062459		
Field of study	Transport		
Date of commencement of studies	February 2027	Academic year of realisation of subject	2027/2028
Education level	second-cycle studies	Subject group	Specialty 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	3.0
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		
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	15.0	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	5.0	25.0	75

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_U02] presents logical and solid arguments regarding the obtained results, through analysis, synthesis of information in various technical contexts, critically approaching their interpretation	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.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
[K7_K02] makes competent and ethical decisions, caring for the public interest and maintaining economic, social and environmental values	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	[SK5] Assessment of ability to solve problems that arise in practice
[K7_W01] identifies in an in-depth way phenomena related to the field of study as well as theories describing them and possible methods of analyzing processes occurring in the life cycle of technical systems	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

<table>
<tr><td>Subject contents</td><td>Course content – lecture

LECTURE
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

PROJECT
Design of the control system and dependence of a small railway station

LABORATORY

Identification of contradictory / non-contradictory waveforms
Calculation of bandwidth
Simulation of the operation of a railway station

Operation of the Local Control Center</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>The student should know the railroad infrastructure, especially the structure of railway turnouts.
The student should know the basic assumptions of railway traffic engineering.</td></tr>
<tr><td>Assessment methods and criteria</td><td><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>general design of the railway station control system</td><td>60.0%</td><td>30.0%</td></tr>
<tr><td>solving a group of tasks</td><td>60.0%</td><td>30.0%</td></tr>
<tr><td>test</td><td>60.0%</td><td>40.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>Dąbrowa-Bajon M.: Podstawy sterowania ruchem kolejowym. Funkcje, wymagania, zarys techniki. OWPW, Warszawa 2007.
Dyduch J., Kornaszewski M.: Systemy sterowania ruchem kolejowym. Wydawnictwo Politechniki Radomskiej, Radom 2007.
Żurkowski A., Pawlik M., Ruch i przewozy kolejowe. Sterowanie ruchem. Warszawa 2010</td></tr>
<tr><td>Supplementary literature</td><td>Dąbrowa-Bajon M.: Automatyzacja sterowania ruchem kolejowym. Tom 2. WPW, Warszawa 1983.
Dąbrowa-Bajon M.: Automatyzacja sterowania ruchem na liniach kolejowych. WPW, Warszawa 1980.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Design of a small station control system
Calculation of the deployment of traffic control devices
Bandwidth calculations
Present the srk system as a Mealy automaton.
Introduce the basic types of signaling devices.
List the basic functions of the station lock.
Describe how to implement a station blockade in key devices.
Station operation simulator</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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