GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Transprt Control Systems and Devices, PG_00044647
Field of study	Transport

Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
Education level	first-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	3	Language of instruction	Polish
Semester of study	6	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	exam

Conducting unit	Department of Electrified Transportation -> Faculty of Electrical and Control 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	30.0	15.0	15.0	0.0	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	35.0	100

Subject objectives	The main target of the course is the student's mastery of knowledge regarding traffic control processes. Students know the rules, systems and devices for railway traffic control, public transport and road traffic control. In addition, the student will choose on their own ability to traffic control devices depending on the transport system and trafic requirements.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W17] has proficiency in transport systems as appropriate for their specialty	The student is able to use the knowledge of the issues of control in transport for the purposes of theoretical and design analyses.	
	[K6_U12] able to select tools and methods, carry out assessments and simple tests of transport systems to an extent required of the specialty / learning profile	The student is able to choose the traffic control devices at the railway station. The student is able to arrange traffic lights at the intersection.	

Subject contents	Course content – lecture LECTURE Equipment for traffic control systems using by road and rail transport: railway signaling, shapes and light signals. Railway signaling systems, types of signals, indicators used in rail transport. Rail traffic control systems, busy track control systems, track circuits, track sensors. railway traffic control, transmission between the track and vehicle. European train control system ETCS, the definition, technical standards and equipment. Rail crossing security systems, automatic signaling, computer control, methods of detecting the presence of vehicles at the crossing. Automatisation of hump yards. Traffic control systems for underground railways. Full automation of rail transport, unmanned passenger and cargo systems. Control systems used in urban transport. Traffic signs and signals. Methods and algorithms used in traffic lights control systems. Methods for automatic detection, license plate reading and registration of vehicles. Control of traffic in large urban agglomerations. Full automation of road vehicles. Vehicle working and supply control. Control of transportation behaviour. LABORATORY Testing of busy track control system galvanic type. Testing of busy track control system - resonance type. Testing of SHP sensor. Control traffic between two stations using the SBL system. Traffic control at the stations. Traffic control on a hump yard. Methods for continuous vehicle location.
Prerequisites and co-requisites	Basic knowledge of electrical engineering and automatic control engineering.

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project evaluation	50.0%	15.0%
	Report from laboratory exercises	50.0%	15.0%
	Final exam - oral	60.0%	70.0%

Recommended reading	Basic literature	Vuhic V.: Urban transit, systems and technology. Viley 2007. Rojek A.: Tabor i trakcja kolejowa. Warszawa: KOW 2010. Bergiel K., Karbowiak H.: Automatyzacja prowadzenia pociągu. Łódź, EMI-PRESS 2005. Dyduch J., Pawlik M.: Systemy automatycznej kontroli jazdy pociągu. Radom, Wyd. PR 2002. Dyduch J., Kornaszewski M.: Systemy sterowania ruchem kolejowym. Radom, Wyd. PR 2004. Dąbrowa-Bajon M.: Podstawy sterowania ruchem kolejowym. Warszawa, OWPW 2002. Leślo M., Guzik J.: Sterowanie ruchem drogowym cz. I i II. Gliwice, WPS 2000. Malarski M.: Inżynieria ruchu lotniczego. Warszawa, OWPW 2006.
	Supplementary literature	Periodics: Technika Transportu Szynowego, Transport Miejski i Regionalny. Periodic: Elektrische Bahnen.
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Practical activites within the subject	Not applicable	

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