



Subject card

Subject name and code	ELECTROMOBILITY, PG_00036790							
Field of study	Automation, Robotics and Control Systems							
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	2	Language of instruction			Polish			
Semester of study	3	ECTS credits			2.0			
Learning profile	general academic profile	Assessment form			assessment			
Conducting unit	Department of Electrical Engineering of Transport -> Faculty of Electrical and Control Engineering							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Leszek Jarzębowicz					
	Teachers							
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM	
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30	
	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	30		5.0		15.0	50	
Subject objectives	Gaining knowledge and practical skills in the scope of electromobility							
Learning outcomes	Course outcome	Subject outcome			Method of verification			
	K7_U03	Students present their proposal of simulation scenario.			[SU4] Assessment of ability to use methods and tools			
	K7_U07	Students analyse energy consumption of autonomous and catenary-supplied vehicles.			[SU1] Assessment of task fulfilment			
	K7_W11	Students use specialized software for vehicles' energy consumption analysis.			[SW3] Assessment of knowledge contained in written work and projects			
	K7_W06	Students analyse torque control algorithms in traction electric drives.			[SW3] Assessment of knowledge contained in written work and projects			
K7_U04	Students review references for gaining knowledge about vehicle's active safety systems, which is required to carry out lab exercise.			[SU2] Assessment of ability to analyse information				
Subject contents	Wykład: Elektryczne układy napędowe pojazdów. Samochody hybrydowe. Systemy ładowania samochodów elektrycznych. Sieci informatyczne w samochodach i infrastrukturze. Energochłonność samochodów elektrycznych. Laboratorium: Systemy kontroli trakcji w pojazdach elektrycznych wielosilnikowych. Kształtowanie profilu prędkości. Analiza energochłonności samochodów elektrycznych i hybrydowych. Analiza działania systemu ABS wykorzystującego napęd elektryczny bezpośredni.							
Prerequisites and co-requisites	Basic knowledge in the fields of: electrical engineering, control engineering, electric machines, electric drives, solving differential equations.							
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade			
	Raports and discussion	60.0%			40.0%			
	Lecture test	60.0%			60.0%			
Recommended reading	Basic literature	Ehsani M., Gao Y., Longo S., Ebrahimi K.: Modern Electric, Hybrid Electric, and Fuel Cell Vehicles. 3rd Edition. CRC Press, 2018 Hayes J.G., Goodarzi G.A.: Electric Powertrain. Energy Systems, Power Electronics and Drives for Hybrid, Electric and Fuel Cell Vehicles. Wiley 2018. Skibicki J.: Pojazdy elektryczne. Część 1. Wydawnictwo PG, 2010 Skibicki J.: Pojazdy elektryczne. Część 2. Wydawnictwo PG, 2012						
	Supplementary literature	Siłka W.: Teoria ruchu samochodu. Warszawa: WNT 2002.						

	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	List the communication standards that are suitable for controlling vehicle's drivetrain. Discuss the motivation behind introducing constant-power operating region in vehicles.	
Work placement	Not applicable	