



Subject card

Subject name and code	ELECTROMOBILITY, PG_00036790						
Field of study	Automation, Robotics and Control Systems						
Date of commencement of studies	February 2024	Academic year of realisation of subject			2024/2025		
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 Electrified Transportation -> 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_U04	He/she uses references for gaining knowledge about vehicle's active safety systems, which is required to carry out a lab exercise.			[SU2] Assessment of ability to analyse information		
	K7_W06	He/she analyses torque control algorithms in traction electric drives.			[SW3] Assessment of knowledge contained in written work and projects		
	K7_U03	He/she presents his/her own proposal of the simulation scenario.			[SU4] Assessment of ability to use methods and tools		
	K7_U07	He/she determines the energy consumption of autonomous or catenary-supplied vehicles.			[SU1] Assessment of task fulfilment		
	K7_W11	He/she uses specialized software for vehicles' energy consumption analysis.			[SW3] Assessment of knowledge contained in written work and projects		
Subject contents	Wykład: Vehicles' electric drivetrains. Hybrid-electric and electric cars. Vehicles' charging systems. elektrycznych. Energy consumption of vehicles. Energy storages. Self-driving vehicles.						
	Laboratorium: Traction control systems in multi-motor electric vehicles. Speed profile shaping. Analysis of energy consumption of electric and hybrid cars. Analysis of the operation of the ABS system using direct electric drive.						
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		
	Lecture test	60.0%			60.0%		
	Raports and discussion	60.0%			40.0%		

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	Discuss the motivation behind introducing constant-power operating region in vehicles. Discuss levels of autonomy in the context of automated driving.	
Work placement	Not applicable	

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