



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

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