



Subject card

Subject name and code	Electromobility II, PG_00058675						
Field of study	Hydrogen Technologies and Electromobility						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2024/2025		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study 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	5	ECTS credits			3.0		
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	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	6.0		24.0		75
Subject objectives	Gaining knowledge about issues related to electromobility.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W10] knows the basics of the processing, use and rational use of electricity, including the principles of electric traction in various transport systems	The student knows the main factors affecting the energy consumption of electric vehicles.			[SW1] Assessment of factual knowledge		
	[K6_U12] can formulate a specification of simple engineering tasks of a practical nature related to the field of study	Student potrafi wyspecyfikować parametry potrzebne do analizy dynamiki ruchu pojazdu elektrycznego.			[SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_W16] He has basic knowledge of the current state and the latest development trends related to the field of study.	The student knows the presently used present technologies and development trends in electromobility.			[SW1] Assessment of factual knowledge		
	[K6_W15] he has knowledge of the construction, principles of operation and operation of electromagnetic energy converters used in transport systems and systems.	The student knows the types and features of electric drive systems used in electromobility.			[SW1] Assessment of factual knowledge		
	[K6_K02] can work in a group taking on different roles in it	The student is able to cooperate with other members of the laboratory group.			[SK2] Assessment of progress of work		
Subject contents	Vehicle electric drive systems. Active safety systems. Energy consumption of electric vehicles. Vehicle energy storages. Electric and hybrid-electric cars. Autonomously driven vehicles. Vehicle charging systems and standards. Vehicle and infrastructure IT networks.						
Prerequisites and co-requisites	Basic knowledge of physics, electrical machines, power electronics, electric drives, electrical engineering in transportation. Ability to solve simple electrical circuits.						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	Raports and preparation for laboratory	60.0%			30.0%		
	Test on the lecture part	60.0%			70.0%		

Recommended reading	Basic literature	<p>Ehsani M., Gao Y., Longo S., Ebrahimi K.: Modern Electric, Hybrid Electric, and Fuel Cell Vehicles. 3rd Edition. CRC Press, 2018</p> <p>Hayes J.G., Goodarzi G.A.: Electric Powertrain. Energy Systems, Power Electronics and Drives for Hybrid, Electric and Fuel Cell Vehicles. Wiley 2018.</p> <p>Pistoia G., Liaw B.: Behaviour of Lithium-Ion Batteries in Electric Vehicles: Battery Health, Performance, Safety, and Cost. Springer 2018.</p> <p>Găiceanu M. (red.): Self-Driving Vehicles and Enabling Technologies. IntechOpen 2021</p>
	Supplementary literature	Karwowski K. (red.): Energetyka transportu zelektryfikowanego. Zbiór zadań problemowych. Wyd. PG, 2023.
	eResources addresses	Adresy na platformie eNauczenie:
Example issues/ example questions/ tasks being completed	<p>Discuss the types and construction of hybrid combustion-electric cars.</p> <p>List the electric car charging standards used around the world and present their basic features.</p>	
Work placement	Not applicable	