



Subject card

Subject name and code	Electromobility and Hydrogen Technologies, PG_00055970						
Field of study	Power Engineering, Power Engineering, Power Engineering						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2026/2027		
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	4		Language of instruction		Polish		
Semester of study	7		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
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		dr hab. inż. Jacek Skibicki				
	Teachers		dr hab. inż. Jacek Skibicki				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	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		2.0		18.0	50
Subject objectives	Presenting to students the current state of knowledge regarding broadly understood electromobility and the use of hydrogen as a fuel in vehicles.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W03] knows the basics of automation and automatic regulation, knows the principles of the selection of electrical devices, drive systems and their control		Specifies possible drive system solutions for particular types of electric vehicles.		[SW1] Assessment of factual knowledge		
	[K6_W05] has structured knowledge in the field of electrical engineering and electronics, necessary to understand the basics of operation and selection of electrical machines, electricity transmission systems and power electronic devices		Determines the advantages and disadvantages of individual electric means of transport in urban conditions. Defines the parameters of hybrid drive systems of road vehicles for individual configurations.		[SW1] Assessment of factual knowledge		
Subject contents	Course content – lecture LECTURE: The concept of electromobility - areas of application. Urban and intercity transport systems - features and properties. The use of electricity in public and individual transport. Types of electric vehicles - power supply methods. Types of energy storage devices used in electric vehicles. Hopper loading methods and infrastructure for this process. Hybrid vehicles - construction variants and drive system configurations. Fuel cells and their use in vehicles. Problems of producing, transporting and storing hydrogen fuel. Types of hydrogen vehicles, areas of application, advantages and disadvantages. Elements of transport energy.						
Prerequisites and co-requisites	Knowledge of the basics of electrical engineering, electronics and electrical machines.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Colloquium on lecture content		60.0%		100.0%		

Recommended reading	Basic literature	1. Kwiatkiewicz P., Szczerbowski R., Śledzik W.: Elektromobilność - środowisko infrastrukturalne i techniczne wyzwania polityki intraregionalnej. Poznań, Wydawnictwo Naukowe FNCE 2020. 2. Merkisz J. Pielecha I.: Alternatywne napędy pojazdów. Poznań, Wydawnictwo Politechniki Poznańskiej 2006. 3. Gronowicz J.: Gospodarka energetyczna w transporcie lądowym. Poznań, Wydawnictwo Politechniki Poznańskiej 2004. 4. Szalek A.: Ognia paliwowe i hybrydowe układy napędowe w motoryzacji. Warszawa, Polskie Wydawnictwo Ekonomiczne 2023. 5. Czerwiński A.: Akumulatory, baterie, ognia. Warszawa, Wydawnictwo Komunikacji i Łączności 2005. 6. Karwowski K. (red.): Energetyka transportu zelektryfikowanego - poradnik inżyniera. Gdańsk, Wydawnictwo Politechniki Gdańskiej 2020.
	Supplementary literature	1. Karbowski H.: Podstawy infrastruktury transportu. Łódź, Wydawnictwo Wyższej Szkoły Humanistyczno-Ekonomicznej w Łodzi 2009. 2. Basiewicz T., Gołaszewski A., Rudziński L. Infrastruktura transportu. Warszawa, Oficyna Wydawnicza Politechniki Warszawskiej 2002. 3. Towpik K.: Infrastruktura transportu szynowego. Warszawa, Oficyna Wydawnicza Politechniki Warszawskiej 2017. 4. Szela A., Drązek Z., Maciolek T.: Elektroenergetyka miejskiej trakcji elektrycznej. Radom, Instytut Naukowo-Wydawniczy Spatium 2017. 5. Szela A.: Trakcja elektryczna - podstawy. Warszawa, Oficyna Wydawnicza Politechniki Warszawskiej 2019.
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Practical activities within the subject	Not applicable	

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