



Subject card

Subject name and code	Guaranted Supply Systems, PG_00041824						
Field of study	Electrical Engineering						
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	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Power Electronics and Electrical Machines -> Faculty of Electrical and Control Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Jarosław Łuszcz				
	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	Presentation of Power Quality problems and adequate improvement solutions.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K7_U02	is able to prepare and present a short presentation on a selected technical topic			[SU5] Assessment of ability to present the results of task		
	K7_W02	has an structured knowledge of electrical measurements			[SW1] Assessment of factual knowledge		
	K7_U03	Is able to obtain information from literature			[SU3] Assessment of ability to use knowledge gained from the subject		
K7_W01	Knowledge in the field of quality pf powering electrical devices.			[SW1] Assessment of factual knowledge			
Subject contents	Power quality indices related to supply continuity. Reasons and effects of supply discontinuity. Interruptible power supply systems - standards, classification, topologies. Dynamic UPS. Redundant UPS systems. Batteries used in UPS (VRLA). State-of-the-art in energy storage systems.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Task report		50.0%		50.0%		
	Lecture reports		50.0%		50.0%		

Recommended reading	Basic literature	<p>Iwan K., Musznicki P., Guziński J., Łuszcz J. Podstawy energoelektroniki. Laboratorium, Biblioteka Cyfrowa PG, ISBN 978-83-7348-398-9, Rok wydania: 2011</p> <p>Antoni Dmowski. Energoelektroniczne układy zasilania prądem stałym w telekomunikacji i energetyce. WNT, Warszawa, 1998.</p> <p>Tadeusz Sutkowski. Rezerwowe i bezprzerwowe zasilanie w energię elektryczną - urządzenia i układy. 2009.</p> <p>Julian Wiatr, Mirosław Miegoń. Zasilacze UPS oraz baterie akumulatorów w układzie zasilania gwarantowanego. DW MEDIUM, 2008.</p> <p>Julian Wiatr: Zespoły prądotwórcze w układach awaryjnego zasilania obiektów budowlanych. Zeszyty dla elektryków - nr 3</p> <p>Alexander King, William Knight. Uninterruptible Power Supplies. MCGRAW HILL BOOK CO, 2002.</p> <p>Abdolhosein Nasiri, Ali Emadi, Stoyan B.: Uninterruptible Power Supplies and Active Filters. CRC Press 2004.</p>
	Supplementary literature	<p>PN-EN 62040-3 systemy bezprzewodowego zasilania (UPS)</p> <p>Alexander King, William Knight. Uninterruptible Power Supplies. MCGRAW HILL BOOK CO, 2002.</p> <p>Abdolhosein Nasiri, Ali Emadi, Stoyan B.: Uninterruptible Power Supplies and Active Filters. CRC Press 2004.</p>
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	<p>Power quality measurements in the laboratory.</p> <p>Power quality analysis in an industrial environment.</p> <p>The study of selected parameters of the UPS.</p> <p>Examination of the dynamic parameters of the UPS.</p>	
Work placement	Not applicable	