



Subject card

Subject name and code	Quality of Electric Energy (PQ I), PG_00054545						
Field of study	Electrical Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2023/2024		
Education level	first-cycle studies	Subject group					
Mode of study	Part-time studies	Mode of delivery			at the university		
Year of study	3	Language of instruction			Polish		
Semester of study	6	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	dr hab. inż. Jarosław Łuszcz					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	20.0	0.0	10.0	0.0	0.0	30
	E-learning hours included: 0.0						
Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=11893							
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	Presentation of the issues related to the quality of electricity in an industrial environment.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_K05	Ability to provide first aid in emergencies.			[SK3] Assessment of ability to organize work		
	K6_U10	The ability to take into account the requirements of the power quality in the design of electrical installations.			[SU3] Assessment of ability to use knowledge gained from the subject		
	K6_U09	Ability to select electrical equipment to assess the power quality.			[SU1] Assessment of task fulfilment		
	K6_K01	Knowledge of sources of specialist knowledge extending the scope of the course content.			[SK5] Assessment of ability to solve problems that arise in practice		
	K6_W11	The student knows the principles of designing electrical installations			[SW1] Assessment of factual knowledge		
	K6_W10	The student knows the principles of processing, use and rational use of electrical energy			[SW1] Assessment of factual knowledge		
	K6_U05	He can organize work in accordance with the principles of safety rules.			[SU1] Assessment of task fulfilment		
K6_W09	Ability to take into account the requirements of power quality in power design.			[SW3] Assessment of knowledge contained in written work and projects			
Subject contents	Power quality indices. Standardization requirements. Reasons for the degradation of energy quality. Sources of harmonic distortions. The effects of poor energy quality.						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	Assesment of report	60.0%			50.0%		
	Task realization assesment	60.0%			50.0%		

Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Kowalski Z.: Jakość energii elektrycznej. Wyd. Politechniki Łódzkiej 2007. 2. Strzelecki R., Benysek G.: Power Electronics in Smart Electrical Energy Networks. Springer 2008. 3. Strzelecki R., Supronowicz H.: Współczynnik mocy w systemach zasilania prądu przemiennego i metody jego poprawy. Wyd. Politechniki Warszawskiej 2007. 4. A. Kempki: Elektromagnetyczne zaburzenia przewodzone w układach napędów przekształtnikowych. Oficyna Wydawnicza Uniwersytetu Zielonogórskiego 2005. 5. R. Smoleński: Conducted Electromagnetic Interference (EMI) in Smart Grids. Springer 2012. 6. Gregorio Romero Rey and Luisa Martinez Muneta (Ed.) Power Quality Harmonics Analysis and Real Measurements Data . , Croatia : InTech, 2011. 7. Ahmed Zobaa, Mario Manana Canteli and Ramesh Bansal: Power Quality Monitoring, Analysis and Enhancement. InTech 2011.
	Supplementary literature	<ol style="list-style-type: none"> 1. Baggini A.: Handbook of Power Quality. John Wiley & Sons 2008. 2. Benysek G.: Improvement in the Quality of Delivery of Electrical Energy using Power Electronics Systems. Springer 2007. 3. Hanzelka Z., Bień A.: Power quality application guide : harmonics, interharmonics. European Copper Institute, Brussels 2004.
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>JAKOŚĆ ENERGII ELEKTRYCZNEJ (PQ I) [ET][I][Niestacjonarne] [2023/24L] - Moodle ID: 35306 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=35306</p>
Example issues/ example questions/ tasks being completed	Assessment of power quality compliance with the requirements of standards,	
Work placement	Not applicable	