

SDAŃSK UNIVERSITY 的 OF TECHNOLOGY

Subject card

Quality of Electric Energy (PQ II), PG 00036793							
February 2023		Academic year of realisation of subject			2023/2024		
second-cycle studies		,					
Full-time studies		Mode of delivery			at the university		
1					Polish		
2		ECTS credits			2.0		
general academic profile		Assessment form			assessment		
Department of Power Electronics and Electrical Machines -> Faculty of Electrical and Control Engineering						Engineering	
Subject supervisor	dr hab. inż. Jarosław Łuszcz						
Teachers							
Lesson type	Lecture	Tutorial	Laboratory		t	Seminar	SUM
hours		0.0	15.0	0.0	0.0		30
			Deutieinetien i	_	0 - 16 - 4		
Learning activity			Participation in consultation hours		Self-study		SUM
Number of study hours	30		5.0		15.0		50
Ability to assess the quality of electricity. Ability to perform basic measurements of energy quality.						ality.	
Course outcome		Subject outcome			Method of verification		
K7_W01		has an extended knowledge of the power quality			[SW1] Assessment of factual knowledge		
K7_W02					[SW1] Assessment of factual knowledge		
		literature sources.			[SU2] Assessment of ability to analyse information		
K7_U02		is able to prepare and present a short oral presentation on a selected technical topic			[SU5] Assessment of ability to present the results of task		
Methods of power quality indices defining. Sources of harmonics and inter-harmonics in power system. Influence of power electronics converters on power quality. Methods of power quality improvement - passive and active filtering. Simulation analysis of non-linear load on voltage quality. Analysis of exemplary power guality long-term-recording data.							
Subject passing criteria		Passing threshold		Percentage of the final grade			
Lecture report		50.0%		50.0%			
Tasj report		50.0%			50.0%		
		kódzkiej 2007. Strzelecki R., Benysek G.: Power Electronics in Smart Electrical Energy Networks. Springer 2008. Strzelecki R., Supronowicz H.: Współczynnik mocy w systemach zasilania prądu przemiennego i metody jego poprawy. Wyd. Politechniki Warszawskiej 2007. A. Kempski: Elektromagnetyczne zaburzenia przewodzone w układach napędów przekształtnikowych. Oficyna Wydawnicza Uniwersytetu Zielonogórskiego 2005. R. Smoleński: Conducted Electromagnetic Interference (EMI) in Smart Grids. Springer 2012. Gregorio Romero Rey and Luisa Martinez Muneta (Ed.) Power Quality Harmonics Analysis and Real Measurements Data . , Croatia : InTech, 2011. Ahmed Zobaa, Mario Manana Canteli and Ramesh Bansal: Power Quality Monitoring, Analysis and Enhancement. InTech 2011.					
	Electrical Engineering February 2023 second-cycle studies Full-time studies 1 2 general academic pro Department of Power Subject supervisor Teachers Lesson type Number of study hours E-learning hours inclu Learning activity Number of study hours Ability to assess the of Course out K7_W01 K7_W02 K7_U03 K7_U02 Methods of power qu Influence of power ele and active filtering. S quality long-term-reco	Electrical Engineering February 2023 second-cycle studies Full-time studies 1 2 general academic profile Department of Power Electronics an Subject supervisor Teachers Lesson type Lecture Number of study hours E-learning hours included: 0.0 Learning activity Participation in classes includ plan Number of study hours Ability to assess the quality of electri Course outcome K7_W01 K7_W02 K7_U02 K7_U03 K7_U02 Methods of power quality indices de Influence of power electronics conve and active filtering. Simulation analy quality long-term-recording data. Subject passing criteria Lecture report Tasj report	February 2023 Academic y realisation second-cycle studies Subject gro Full-time studies Mode of de 1 Language de 2 ECTS cred general academic profile Assessmer Department of Power Electronics and Electrical Ma Subject supervisor dr hab. in2. Ja Teachers Image: Classing activity Lesson type Lecture Learning hours included: 0.0 Learning activity Participation in didactic classes included in study plan Number of study hours 30 Ability to assess the quality of electricity. Ability to p Course outcome Subjet K7_W01 has an extence power quality K7_U02 is able to preq short oral pres selected tech Methods of power quality indices defining. Sources Influence of power electronics converters on power and active filtering. Simulation analysis of non-linea quality long-term-recording data. Subject passing criteria Pass Lecture report Sou% Sou% Ray active filtering. Simulation analysis of non-linea quality long-term-recording data. Subject passing criteria Pass Lecture report Sou% Sou%	Electrical Engineering February 2023 Academic year of realisation of subject second-cycle studies Subject group Full-time studies Mode of delivery 1 Language of instruction 2 ECTS credits general academic profile Assessment form Department of Power Electronics and Electrical Machines -> Fact. Subject supervisor dr hab. in2. Jaroslaw Łuszcz Teachers	Electrical Engineering February 2023 Academic year of realisation of subject second-cycle studies Subject group Full-time studies Mode of delivery 1 Language of instruction 2 ECTS credits general academic profile Assessment form Department of Power Electronics and Electrical Machines -> Faculty of El Subject supervisor dr hab. in2. Jaroslaw Luszcz Teachers Elesson type Lesson type Lecture Number of study 15.0 Number of study 15.0 Number of study 30 Subject outcome Subject outcome K7_W01 has an extended knowledge of the power quality for electricity. Ability to perform basic measure K7_W02 has a structured knowledge of electrical measurements K7_U03 Ability to obtain information from literature sources. K7_U03 Ability to obtain information from literature sources. K7_U03 Ability to obtain information from literature sources. K7_U03 Simulation analysis of non-linear load on voltage qual quality long-term-recording data. Subject passing criteria Passing threshold	Electrical Engineering Academic year of realisation of subject 2023/realisation of subject February 2023 Academic year of realisation of subject 2023/realisation of subject second-cycle studies Subject group Itel time studies Mode of delivery at the 1 Language of instruction Polish 2.0 general academic profile Assessment form assess Department of Power Electronics and Electrical Machines -> Faculty of Electrical Subject supervisor dr hab. inz. 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Jaroslaw Luszcz Teachers Elesson type Ecture Tutorial Laboratory Project Seminar Number of study 15.0 0.0 15.0 0.0 0.0 15.0 Number of study 30 5.0 15.0 15.0 0.0 15.0 Number of study 30 5.0 15.0 15.0 15.0 15.0 Number of study 30 5.0 15.0 15.0 16.0 16.0 16.0 16.0 16.0 16.0 16.0 16.0 16.0 16.0 16.0 16.0 16.0 16.0 16.0 16.0 16.0 16.0

	Supplementary literature	Baggini A.: Handbook of Power Quality. John Wiley & Sons 2008. Benysek G.: Improvement in the Quality of Delivery of Electrical Energy using Power Electronics Systems. Springer 2007. Hanzelka Z., Bień A.: Power quality application guide : harmonics, interharmonics. European Copper Institute, Brussels 2004.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Writing of the power quality report.	
Work placement	Not applicable	