



Subject card

Subject name and code	Advanced Power Systems, PG_00069140						
Field of study	Electrical Engineering, Automation, Robotics and Control Systems						
Date of commencement of studies	February 2026	Academic year of realisation of subject				2026/2027	
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				3.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Department of Power Electronics and Electrical Machines -> Faculty of Electrical and Control Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Jarosław Łuszcz				
	Teachers						
Lesson types	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		5.0		25.0	75
Subject objectives	Transfer of knowledge about innovative technologies used in power supply systems for electrical devices and control systems.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
Subject contents	<p>Course content – lecture</p> <p>Lecture:</p> <p>Introduction to power quality. AC and DC power grids. Device interference and power quality problems. Impact of power quality on devices and control systems. Power quality improvement methods. Power quality monitoring and analysis. Uninterruptible power supply and battery backup systems. Power supply for critical infrastructure and autonomous systems. Integration of renewable energy sources and smart grids. Innovative power supply technologies: energy from the environment and wireless transfer.</p> <p>Laboratory:</p> <p>Real-time measurements of power quality. Analysis of recorded power quality parameters. Study of harmonic distortions generated by devices. Study of harmonic distortions generated by power electronic converters. Study of the effectiveness of selected methods of improving the power quality of devices Study of uninterruptible power supply systems.</p> <p>Project:</p> <p>Literature study in the field of modern power supply systems.</p>						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Active participation in classes		50.0%		25.0%		
	Laboratory reports		50.0%		25.0%		
	Semester project report		50.0%		50.0%		

Recommended reading	Basic literature	Hanzelka, Zbigniew, Jakość dostawy energii elektrycznej: zaburzenia wartości skutecznej napięcia. Komitet Elektrotechniki Polskiej Akademii Nauk. Kraków: Wydawnictwa AGH, 2013. Wasiak, Irena; Pawelek, Ryszard. <i>Jakość zasilania w sieciach z generacją rozproszoną</i> . Red. . Warszawa: Wydawnictwo Naukowe PWN, 2015, ISBN 978-83-01-18945-7
	Supplementary literature	R. C. Dugan, M. F. McGranaghan, S. Santoso, H. W. Beaty 2012: <i>Electrical Power Systems Quality</i> , 3th edition, The McGraw-Hill Companies, Inc., NY, USA, 2012, ISBN 978-0071761550. Baggini, A.B. <i>Handbook of Power Quality</i> ; Wiley Online Library: Hoboken, NJ, USA, 2008; ISBN 9780470065617.
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Practical activities within the subject	Not applicable	

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