



Subject card

Subject name and code	Protection Automatics in Electric Power Systems, PG_00050033						
Field of study	ELEKTROENERGETYCZNA AUTOMATYKA ZABEZPIECZENIOWA						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
Education level	second-cycle studies		Subject group				
Mode of study	Part-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 Electrical Power Engineering -> Faculty of Electrical and Control Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Zbigniew Lubośny				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	10.0	0.0	10.0	0.0	0.0	20
	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	20		3.0		27.0	50
Subject objectives	Understanding the purpose and operating principles of power protection systems. Ability to select power station equipment elements in the field of power protection and automation.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W05] has detailed knowledge of the regulatory processes in the electricity system electricity system, electricity safety and electricity safety automation		Analyses and interprets processes occurring in the power system.		[SW1] Ocena wiedzy faktograficznej		
	[K7_W11] has detailed knowledge of substation construction, is familiar with the principles of selecting substation facilities and equipment, is familiar with technologies high voltage		Selects the components of power stations.		[SW1] Ocena wiedzy faktograficznej		
	[K7_U10] is able to calculate short-circuit currents, select substation equipment including power system automation protection automatics		Uses mathematical methods to solve problems covered by the course.		[SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu		
	[K7_K04] correctly identifies and resolves dilemmas associated with the exercise of the profession, in particular relating to responsibility for his own safety and the safety of others		Solves problems related to the safety of persons and property that occur in practice.		[SK5] Ocena umiejętności rozwiązywania problemów występujących w praktyce		
Subject contents	Course content – lecture Lecture: Electric power as a secured facility. The role of system protection and requirements. Current transformers and their connection. Voltage transformers and their connection. Theory of electric power system protection. Analog and digital relays. Basic types of protection criteria: overcurrent, voltage, differential, impedance, and angle. Information transmission in protection systems. MV transmission lines protection systems. The lines distortion. Overcurrent protection devices. Overcurrent directional protection devices. Differential protection devices. Earth fault protection devices. Automatic re-closing devices. Congestion protection devices, Voltage asymmetry protection devices.						
	Laboratory: Testing of power protection: overcurrent, voltage, differential, impedance.						

Prerequisites and co-requisites	Electric power systems: structures and operation.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Midterm colloquium	60.0%	100.0%
Recommended reading	Basic literature	J. Żydanowicz, M. Namiotkiewicz: Automatyka zabezpieczeniowa w elektroenergetyce. WNT, Warszawa 1983. W. Winkler, A. Wiszniewski: Automatyka zabezpieczeniowa w systemach elektroenergetycznych. WNT, Warszawa 1999. W. Korniluk, K. W. Woliński: Elektroenergetyczna automatyka zabezpieczeniowa. Wydawnictwo Politechniki Białostockiej, Białystok 2008, 2012	
	Supplementary literature	B. Synal, W. Rojewski, W. Dzierżanowski: Elektroenergetyczna automatyka zabezpieczeniowa. Oficyna wydawnicza Politechniki Wrocławskiej, Wrocław 2003. R. Kowalik, M. Januszewski, A. Smolarczyk: Cyfrowa elektroenergetyczna automatyka zabezpieczeniowa. Oficyna wydawnicza Politechniki Warszawskiej, Warszawa 2006. J. Lorenc: Admitancyjne zabezpieczenia zwarciove, Wydawnictwo Politechniki Poznańskiej, Poznań 2007	
	eResources addresses		
	Example issues/ example questions/ tasks being completed	Select the settings of the delayed and instantaneous overcurrent protection in the HV / MV substation.	
Practical activites within the subject	Not applicable		

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