

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Power system protection automatics, PG_00064765							
Field of study	Power Engineering							
Date of commencement of studies	February 2025		Academic year of realisation of subject			2025/2026		
Education level	second-cycle studies		Subject group			Specialty subject group Subject group related to scientific research in the field of study		
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			4.0		
Learning profile	general academic profile		Assessment form			assessment		
Conducting unit	Department of Electrical Power Engineering -> Faculty of Electrical and Control Engineering							
Name and surname	Subject supervisor prof. dr hab. inż. Zbigniew Lubośny							
of lecturer (lecturers)	Teachers							
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM
of instruction	Number of study hours	30.0	0.0	15.0	0.0		0.0	45
	E-learning hours inclu	ided: 0.0	-					
Learning activity and number of study hours	Learning activity	Participation in classes includ plan	n didactic ed in study	Participation in consultation hours		Self-study		SUM
	Number of study hours	45		8.0		47.0		100
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						fication	
	[K7_U01] utilizes acquired analytical, simulation, and experimental methods, as well as mathematical models for analysis and evaluation of energy systems, machines and devices, transmission grids and internal installations		Is able to use mathematical methods to solve problems covered by the course.			[SU3] Assessment of ability to use knowledge gained from the subject		
	[K7_W02] demonstrates structured and theory supported knowledge encompassing key issues in the field of Power Engineering, enabling modeling and analysis of energy systems, machines and devices, transmission grids and internal installations		Is able to model elements of the power system to the extent necessary to select protection automation settings.			[SW1] Assessment of factual knowledge		
	[K7_U15] evaluates the feasibility of advanced methods and tools for solving complex engineering tasks of a practical nature, characteristic of the field of study, and selects and applies appropriate methods and tools for this purpose		Is able to apply mathematical methods and acquired knowledge to solve real technical problems in the field of power system protection automation.			[SU3] Assessment of ability to use knowledge gained from the subject		
	[K7_K11] is aware of importance of professional acting, the need for critical verification of acquired knowledge and consulting experts opinion in case of facing difficulties with individual problem solving		Is able to analyse and interpret processes occurring in the power system.			[SK5] Assessment of ability to solve problems that arise in practice		

Subject contents	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.							
Prerequisites and co-requisites	Electric power systems: structures and operation.							
Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade					
and criteria	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 zwarciowe, Wydawnictwo Politechniki Poznańskiej, Poznań 2007 						
	eResources addresses	Adresy na platformie eNauczanie:						
Example issues/ example questions/ tasks being completed	Select the settings of the delayed and instantaneous overcurrent protection in the HV / MV substation.							
Work placement	Not applicable							

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