



## Subject card

Subject name and code	Management and Control in Power Industry, PG_00055967						
Field of study	Power Engineering, Power Engineering, Power Engineering						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2024/2025		
Education level	first-cycle studies	Subject group			Optional 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	3	Language of instruction			Polish		
Semester of study	6	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Zakład Przekształtników i Magazynowania Energii -> Department of Power Electronics and Electrical Machines -> Faculty of Electrical and Control Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Robert Małkowski				
	Teachers						
Lesson types and methods of instruction	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		6.0		49.0	100
Subject objectives	Presentation of selected issues in the field of management and control of the operation of the power system.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W08] has basic knowledge in the field of intellectual property protection and patent law, knows and understands the basic processes of energy production and use, knows and understands the principles of modern heating and power systems		The student knows and understands the principles of the functioning of power systems.		[SW1] Assessment of factual knowledge		
	[K6_U03] has the preparation necessary to work in an industrial environment, applies the principles of occupational health and safety, can perform diagnostics of the regulation system of a simple energy facility		Students can identify selected elements of power system objects and the ways of controlling them. They can indicate positive and negative influence they have on the environment		[SU2] Assessment of ability to analyse information		
Subject contents	<p>Lecture: Connecting electric power subsystems to parallel running after system breakdown. Frequency control in a Power Systems. Influence of automatic control of a tap changing step-up transformer on power capability area of generating unit. Voltage stability.</p> <p>Laboratory: Coupling parameters of simple power grid model elements (generators, transformers, power lines ) to conduct research including various load level in modeled power grid. Calculating load flow. Dependencies of voltage changed and/or transformer tap controllers moves on voltage levels and load flow in analyzed grid.</p>						
Prerequisites and co-requisites							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory	50.0%	40.0%
	Lecture	50.0%	60.0%
Recommended reading	Basic literature	Machowski J., Lubośny Z., Białek J., Bumby J.: Power System Dynamics. Stability and Control. 3rd edition. Hoboken: John Wiley & Sons, 2020. 888 s. ISBN 9781119526346 Małkowski R.: Transformatory z regulacją przekładni pod obciążeniem w systemie elektroenergetycznym. Gdańsk: Politechnika Gdańska, 2019. 96 s. ISBN 978-83-7348-778-9 Machowski J., Lubośny Z.: Stabilność systemu elektroenergetycznego. Warszawa: Wydawnictwo Naukowe PWN, 2018. 920 s. ISBN 978-83-01-20006-0	
	Supplementary literature	Kundur P.: Power System Stability and Control. New York: Mcgraw Hill 1994. ISBN 007035958X.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Describe influence of automatic control of a tap changing step-up transformer on power capability area of generating unit.		
Work placement	Not applicable		