



Subject card

Subject name and code	Electric Power Systems, PG_00055898						
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			Obligatory subject group in the field of study 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	5	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 of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jacek Klucznik					
	Teachers	dr hab. inż. Robert Kowalak dr hab. inż. Jacek Klucznik					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	0.0	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	Knowledge about the transmission of electricity. Understanding the operation principles of the power system. Calculation of the of voltage levels, power losses, short-circuit currents.						
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 performs the calculation of the initial short-circuit current, the power losses and voltage drops in the networks.			[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
	[K6_W05] has structured knowledge in the field of electrical engineering and electronics, necessary to understand the basics of operation and selection of electrical machines, electricity transmission systems and power electronic devices	Student interprets equivalent circuits of line, transformer and generator. Student analyses radial and interconnected networks in normal conditions. Student analyses networks during faults. Student differences active and reactive power sources.			[SW1] Assessment of factual knowledge		
Subject contents	Power system structure. Devices for generation, transmission and distributon of electric energy. Generation of active and reactive power in power system. Sources of power and its characteristics. Electrical network - structure, parameters and purposes. HVDC systems. Equivalent circuits for power system elements. Power flow calculation in radial and interconnected networks. Short-circuits - reasons and effects. Balanced short-circuits calculation.						
Prerequisites and co-requisites	Electric circuits theory						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	Final test	50.0%			30.0%		
	Midterm colloquium	50.0%			70.0%		

Recommended reading	Basic literature	<p>Żmuda K.: Elektroenergetyczne układy przesyłowe i rozdzielcze. Wybrane zagadnienia z przykładami. Wydawnictwo Politechniki Śląskiej, Gliwice 2012.</p> <p>Kacejko P., Machowski J.: Zwarcia w sieciach elektroenergetycznych. WNT, Warszawa, 1993.</p> <p>Lubśny Z.: Zbiór zadań z obliczeń prądów zwarciovych w systemach elektroenergetycznych, skrypt PG.</p> <p>Irena Wasiak ELEKTROENERGETYKA W ZARYSIE Przesył i rozdział energii elektrycznej publikacja dostępna bezpłatnie w Internecie</p>
	Supplementary literature	IEEE Explore selected papers
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	<p>Calculate the value of the initial short-circuit current in the network of a given structure.</p> <p>Calculate the active power losses in the power line of given data parameters and load.</p> <p>Determine distribution of currents in the double-sided supplied network.</p>	
Work placement	Not applicable	