



Subject card

Subject name and code	Transfer of Electric Energy, PG_00042064						
Field of study	Power Engineering, Power Engineering, Power Engineering, Power Engineering, Power Engineering						
Date of commencement of studies	October 2020		Academic year of realisation of subject			2022/2023	
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			3.0	
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. Jacek Klucznik				
			dr hab. inż. Robert Kowalak				
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		5.0		25.0	75
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_W05		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	
	K6_K02		The student performs the calculation of the initial short-circuit current, the power losses and voltage drops in the networks.			[SK2] Assessment of progress of work	
	K6_W04		effect not matching the subject range			[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	
	Midterm colloquium		50.0%			70.0%	
	Final test		50.0%			30.0%	

Recommended reading	Basic literature	<p>Kahl T.: Sieci elektroenergetyczne, WNT Warszawa 1981</p> <p>Kacejko P., Machowski J.: Zwarcia w sieciach elektroenergetycznych. WNT, Warszawa, 1993.</p> <p>Lubony Z.: Zbiór zadań z obliczeń prądów zwarciovych w systemach elektroenergetycznych, skrypt PG.</p>
	Supplementary literature	Acta Energetica – kwartalnik naukowy energetyków www.actaenergetica.org
	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	