



Subject card

Subject name and code	Process Modelling in Electrical Power Engineering, PG_00038373							
Field of study	Electrical Engineering							
Date of commencement of studies	October 2023	Academic year of realisation of subject			2024/2025			
Education level	second-cycle studies	Subject group			Optional subject group Subject group related to scientific research in the field of study			
Mode of study	Part-time studies	Mode of delivery			at the university			
Year of study	2	Language of instruction			Polish			
Semester of study	3	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							
Lesson types and methods of instruction	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	5.0		50.0		75	
Subject objectives	Teaching of modeling and simulations of processes in power systems, using modern computer tools.							
Learning outcomes	Course outcome	Subject outcome			Method of verification			
	K7_W03	Student recognises differences of dynamic models description. Student shows modelling methods of electric network, synchronous generator, excitation systems and turbines.			[SW1] Assessment of factual knowledge			
	K7_K03	Students calculates initial conditions for dynamic models.			[SK5] Assessment of ability to solve problems that arise in practice [SK2] Assessment of progress of work			
	K7_U06	Students builds models of selected power system elements using PowerFactory software.			[SU1] Assessment of task fulfilment			
Subject contents	Modelling of Power system steady and dynamic states. Single machine and multi machine models. Power system components modelling: synchronous generators, asynchronous machines, overhead and cable lines, two and three windings transformers, loads. Modelling of thermal and hydro power plants devices and controllers: prime movers, speed and power governors, excitation systems, voltage controller, power system stabiliser. Modelling of wind generators and wind farms. Reduced models of wind farms.							
Prerequisites and co-requisites	Electric power engineering basics. Power systems.							
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade			
	Final test	50.0%			30.0%			
	Model building	50.0%			70.0%			
Recommended reading	Basic literature	1. Zajczyk R.: „Modele matematyczne systemu elektroenergetycznego do badania elektromechanicznych stanów nieustalonych i procesów regulacyjnych”, Wydawnictwo Politechniki Gdańskiej, 2003. 2. Machowski J., „Regulacja i stabilność systemu elektroenergetycznego”, Oficyna Wydawnicza Politechniki Gdańskiej, Warszawa, 2007.						

	Supplementary literature	<ol style="list-style-type: none"> <li>1. Kcejko P., Machowski J.: „Zwarcia w sieciach elektroenergetycznych”, WNT, Warszawa 2002.</li> <li>2. Lubośny Z.: „Farmy wiatrowe w systemie elektroenergetycznym”, WNT, Warszawa 2009.</li> </ol>
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Single generator model building with turbine model and voltage controller.	
Work placement	Not applicable	