GDAŃSK UNIVERSITY OF TECHNOLOGY

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	1. Kacejko P., Machowski J.: „Zwarcia w sieciach elektroenergetycznych”, WNT, Warszawa 2002. 2. Lubośny Z.: „Farmy wiatrowe w systemie elektroenergetycznym”, WNT, Warszawa 2009.
	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	