GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Process Modelling in Electrical Power Engineering, PG_00063598		
Field of study	MODELOWANIE PROCESÓW W ELEKTROENERGETYCE		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	Specialty 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	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Electrical Power Engineering -> Faculty of Electrical and Control Engineering -> Wydziały Politechniki Gdańskiej		
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

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

eNauczanie source addresses:

Moodle ID: 825 MODELOWANIE PROCESÓW W ELEKTROENERGETYCE [Niestacjonarne][ET][2025/26]
https://enauczanie.pg.edu.pl/2025/course/view.php?id=825

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	25.0	50

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_U06] is able to analyse, model, simulate and design electrical systems	Can analyze processes and phenomena occurring in electrical power systems using mathematical and IT tools.	[SU1] Ocena realizacji zadania
[K7_K03] can interact and work in a group assuming various roles and identify priorities for the achievement of a specific task	He is able to work effectively in a project team, taking on various roles (e.g., leader, analyst, contractor) in the process of modeling electrical phenomena.	[SK3] Ocena umiejętności organizacji pracy
[K7_W03] has an extended and deepened knowledge of the field related to electrical power systems and electrical equipment	Has in-depth knowledge of the principles of operation, mathematical models, and characteristics of electrical power systems and devices. Is familiar with modern modeling and simulation methods used to analyze the operation of electrical power systems and devices.	[SW1] Ocena wiedzy faktograficznej

Subject contents

Lecture: 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.

<table>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Final test</td><td>50.0%</td><td>30.0%</td></tr>
<tr><td>Development and model analysis</td><td>50.0%</td><td>70.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">P. Kundur, Power System Stability and Control, McGraw- Hill, New York, 1994.</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">---</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">Construction and analysis of a power grid with several synchronous generators equipped with a turbine model and voltage regulator</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="3">Not applicable</td></tr>
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