



Subject card

Subject name and code	Modelling and Simulation of Control Systems Applied in Energy Technologies (WOiO), PG_00042105						
Field of study	Power Engineering, Power Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2026/2027		
Education level	first-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	4	Language of instruction			English		
Semester of study	7	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Division of Automation and Marine Energy -> Institute of Naval Architecture -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Mohammad Ghaemi					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	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	30		5.0		65.0	100
Subject objectives	The aim of the course is to learn the principles of modeling and simulation of control systems used in power systems						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
Subject contents	<p>Course content – lecture</p> <ol style="list-style-type: none">1. Principles of making a simulation model of the power control system (lecture)2. Stages of preparing a simulation model of the power control system (lecture)3. Implementation of the simulation model (lab.)4. Simulation model of wind power plant control systems (lecture + lab.)*5. Simulation model of the hydropower plant control system (lecture + lab.)*6. Simulation model of the internal combustion engine control system (lecture + lab.)*7. Simulation model of the gas turbine control system (lecture + lab.)*8. Simulation model of the steam turbine control system (lecture + lab.)*9. Simulation model of electrical generator control system (lecture + lab.)* <p>*) the mathematical model will be presented during the lecture, and the simulation study will be carried out in the lab.</p>						

Prerequisites and co-requisites	Fundamental of Control Systems		
	Power Systems		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Test (for the lecture part)	56.0%	50.0%
	Reports (for the lab. part)	56.0%	50.0%
Recommended reading	Basic literature	Joe H. Chow Rensselaer (2020), Power System Modeling, Computation, and Control. John Wiley & Sons Ltd., NY, USA. ISBN 9781119546870 9available online: https://onlinelibrary.wiley.com/doi/chapter-epub/10.1002/9781119546924.fmatter)	
	Supplementary literature	Egeland O., Tommy J. (2003). Modeling and Simulation for Automatic Control. Marine Cybernetics, Trondheim, Norway. ISBN 82-92356-01-0	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Practical activities within the subject	Not applicable		

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