GDAŃSK UNIVERSITY OF TECHNOLOGY

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 2022	Academic year of realisation of subject	2025/2026
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 -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Mohammad Ghaemi	
	Teachers		

Lesson types and methods of instruction

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

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.)*

*) the mathematical model will be presented during the lecture, and the simulation study will be carried out in the lab.

<table>
<tr><td>Prerequisites and co-requisites</td><td>Fundamental of Control Systems

Power Systems</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Reports (for the lab. part)</td><td>56.0%</td><td>50.0%</td></tr>
<tr><td>Test (for the lecture part)</td><td>56.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>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)</td></tr>
<tr><td>Supplementary literature</td><td>Egeland O., Tommy J. (2003). Modeling and Simulation for Automatic Control. Marine Cybernetics, Trondheim, Norway.ISBN 82-92356-01-0</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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