



## Subject card

Subject name and code	, PG_00058647						
Field of study	Power Engineering						
Date of commencement of studies	February 2024		Academic year of realisation of subject		2024/2025		
Education level	second-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Zakład Maszyn Przepływowych -> Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Marian Piwowarski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	15.0	0.0	45
	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	45		8.0		22.0	75
Subject objectives	The purpose of the course is to familiarize students with issues related to modeling, simulation and control of the power system broken down into component subsystems, namely steam turbine systems, gas turbine systems, boilers, generators, etc.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W06] knows the extended issues of reliability of power equipment and diagnostics of defects in this equipment		Students are familiar with the reliability of power equipment and fault diagnosis in such equipment		[SW1] Assessment of factual knowledge		
	[K7_U05] is able to integrate technical and economic analysis of the use of various energy technologies, including technologies using renewable energy sources and conventional and nuclear energy		Students are able to perform technical and economic analysis of the use of various energy technologies, including technologies using renewable energy sources and conventional and nuclear energy		[SU2] Assessment of ability to analyse information		
	[K7_W07] knows the environmental effects of energy technologies used; is familiar with the issues of effective energy management and use of renewable energy sources, has a broad and well-established knowledge of the processes of energy production and use		Students are able to assess the impact of the use of various energy technologies on the environment; they are familiar with the issues of efficient energy management and the use of renewable energy sources; They have knowledge of energy production and use processes		[SW3] Assessment of knowledge contained in written work and projects		
Subject contents	Characteristics of the power system with a description of its main subsystems, i.e. steam turbines, gas turbines, boilers, heat exchangers, etc. Issues of modeling, simulation and dynamic analysis of power system components. Modeling and dynamics of rotating machinery, power boilers, generators, steam superheaters and other power system components and subsystems. Analysis of transient behavior of rotating machines, boilers or entire power plants. Regulation and control of power plants.						
Prerequisites and co-requisites	-						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Written test		50.0%		50.0%		
	Project		50.0%		50.0%		
Recommended reading	Basic literature		1. Machowski J., Bialek J.W., Bumby J. R. Power System Dynamics, Stability and Control Second Edition, John Wiley & Sons Ltd, , Chichester, United Kingdom, 2008;				

	Supplementary literature	-
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>1. Simulation model of a steam boiler</li> <li>2. Simulation model of steam turbine</li> <li>3. Simulation model of a power generator</li> </ol>	
Work placement	Not applicable	