GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Modelling of Power Equipment, PG_00042199		
Field of study	Power Engineering, Power Engineering, Power Engineering, Power Engineering, Power Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2022/2023
Education level	first-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	6	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Electrical Power Engineering -> Faculty of Electrical and Control Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Andrzej Augusiak	
	Teachers	dr inż. Alicja Lenarczyk	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	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	5.0	25.0	75

Subject objectives

Mathematical modeling definitions and basic types, static and dynamic models, deterministic and stochastic models, modeling of thermodynamic properties of water and steam computational standards used, general types of optimization models related to energy devices, components of mathematical models, integer- and mixed-integer models, modeling of energy devices in GateCycle software.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_W08	The student is able to correctly select the components of thermodynamic cycles in power plants and combined heat and power plants and their design and operating parameters.	[SW3] Assessment of knowledge contained in written work and projects
K6_U02	The student is able to model the balance of the heat exchanger and carry out a technical analysis of the heat exchanger operation in the system	[SU1] Assessment of task fulfilment

Subject contents

LECTURE and SEMINAR Mathematical modeling definitions and basic types, static and dynamic models, deterministic and stochastic models, modeling of thermodynamic properties of water and steam computational standards used, general types of optimization models related to energy devices, components of mathematical models, integer- and mixed-integer models, modeling of energy devices in GateCycle software

LABORATORY Thermodynamic properties of water and steam modeling of water/steam saturation line, optimization of properties in thermal power plants (steam reheating and feed water heating), optimization of insulation thickness in buildings, modeling gas turbine and combined cycle gas turbine power plants in GateCycle software

Prerequisites and co-requisites

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project	60.0%	30.0%
	Test on lecture topics	60.0%	40.0%
	Reports from laboratory classes	60.0%	30.0%
Recommended reading	Basic literature	1. Lewandowski J., Miller A.: Układy gazowo-parowe na paliwa stałe. Perspektywy zastosowań i modelowanie matematyczne. WNT, Warszawa 1993 2. Badyda K.: Zagadnienia modelowania matematycznego instalacji energetycznych. Rozprawa habilitacyjna. Politechnika Warszawska, Warszawa 2001	
	Supplementary literature	2. Lewandowski J., Miller A., Uzunow N., wirski K.: Modelowanie matematyczne procesów cieplno-przepływowych w układach maszyn i urzšdzeń energetycznych. W: I konferencja Problemy Badawcze Energetyki Cieplnej, Warszawa 1993	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Analysis of combined-cycle power plant operation with the selected gas turbine type.		
Work placement	Not applicable		