



Subject card

Subject name and code	Automatic control of flow machines , PG_00055904						
Field of study	Power Engineering, Power Engineering, Power Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject				2023/2024	
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	5	ECTS credits				4.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Faculty of Ocean Engineering and Ship Technology						
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	30.0	0.0	30.0	0.0	0.0	60
	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	60		4.0		36.0	100
Subject objectives	design and analysis fundamentals of turboset control system						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K6_U04] is able to design a simple device structure and prepare the accompanying technical documentation, conduct a basic technical and economic analysis of energy systems, including technologies using renewable and pro-ecological energy sources as well as conventional and nuclear energy, design energy installations for them and their basic elements (including electric lighting)); select, operate and control the most commonly used electrical devices and drive systems.		The student is able to design a simple control system for turbosets and internal combustion engines, and prepare the necessary related technical documentation, conduct a basic technical and economic analysis of these systems, taking into account environmental aspects.			[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject	
	[K6_W03] knows the basics of automation and automatic regulation, knows the principles of the selection of electrical devices, drive systems and their control		The student knows the basics of automatic control of turbosets and engines used in power engineering, including gas and steam turbine sets and internal combustion engines.			[SW1] Assessment of factual knowledge	
Subject contents	Cooperation of a turboset automatic control systems with other systems of control and safety devices. Analysis and research of turboset controllers. Specifics of steam and gas turbines control. Modelling of charged piston engine dynamics. Turbocharging systems of pulsating and constant charging installations. Dynamics of stream and pressure of turbocharging air. System correction. Calculation methods examples. Main disturbance signals. Resonance features. Influence of control system on dynamic processes of an engine control.						
Prerequisites and co-requisites	Knowledge of automatic control and thermal turbines and their thermal cycles.						
Assessment methods and criteria	Subject passing criteria		Passing threshold			Percentage of the final grade	
	tests		50.0%			100.0%	

Recommended reading	Basic literature	1. Domachowski Z.: Regulacja automatyczna turbozespołów ciepłych. Wydawnictwo Politechniki Gdańskiej. Gdańsk, 2011, 2. Graul K., Jenseit W.: Regulacja turbin parowych. WNT, Warszawa, 1962, 3. Domachowski Z.: Steam Turbine Control, In: Steam and Gas turbines - Principles of Operation and Design, ed. by K. Kosowski. Alstom. France, Switzerland, United Kingdom, Poland, 4. Domachowski Z., Automatyka i Robotyka. Podstawy, Wydawnictwo Politechniki Gdańskiej, Gdańsk 2003, 5. Perycz S., Podstawy Automatyki, Politechnika Gdańska, Skrypt , Gdańsk 1985. Automatic Control, Politechnika Gdańska, Skrypt , Gdańsk 1985.
	Supplementary literature	none
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	