



Subject card

Subject name and code	Automatics and Control Engineering, PG_00042181						
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		2.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Department of Control Engineering -> Faculty of Electrical and Control Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Jacek Zawalich				
	Teachers		dr inż. Jacek Zawalich				
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		3.0		17.0	50
Subject objectives	The aim of the course is to provide theoretical and practical knowledge in the field of construction, design and servicing of automated facilities and technical processes in industrial conditions with the use of computer hardware and engineering software.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W03		Student defines, distinguishes and classifies basic automation objects. The student presents the basic methods of modeling, simulation and control of technical objects together with the principles of selecting their elements.		[SW3] Assessment of knowledge contained in written work and projects		
	K6_U03		The student solves tasks in the field of identification, supervising, diagnostics and operation of industrial facilities. The student develops control projects and algorithms implemented in PLC.		[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
Subject contents	<p>LECTURE</p> <p>Division and classification of automation systems. The scope of automation of industrial systems. Requirements for the control of automation systems. Models of controlled objects, their static and dynamic characteristics. Structures of control systems for objects and technical processes. Examples of industrial control systems. Methods of identification, modeling and simulation of objects and automation systems. Types of industrial control devices. Selection of measuring elements, industrial regulators and executive elements. Criteria of the control quality of technical systems.</p> <p>LABORATORY</p> <p>Testing of control systems with the use of models of selected technical objects based on programmable controllers and visualization systems. Selection of industrial regulators, measuring and executive devices, implementation of control, visualization and diagnostics algorithms.</p>						
Prerequisites and co-requisites	Knowledge of the Fundamentals of Automation						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory	100.0%	40.0%
	Lecture	60.0%	60.0%
Recommended reading	Basic literature	1. Findeisen W.: Technika regulacji automatycznej. Warszawa: PWN 1976. 2. Kaczorek T.: Teoria układów regulacji automatycznej, Warszawa: WNT 1979. 3. Tatjewski P.: Sterowanie zaawansowane obiektów przemysłowych. Struktury i algorytmy. Warszawa: EXIT 2002. 4. Śmierzchalski R.: Automatyzacja systemów energetycznych statku, Wydawnictwo Gryf, Gdańsk 2004. 5. Winkler W., Wiszniewski A.: Automatyka zabezpieczeniowa w systemach elektroenergetycznych. WNT, Warszawa 2004. 6. Piegat A.: Modelowanie i sterowanie rozmyte. Warszawa: EXIT 1999. 7. Ogata K.: Modern Control Engineering. 4th edition. Prentice Hall 2002.	
	Supplementary literature	1. Próchnicki W., Dzida M.: Zbiór zadań z podstaw automatyki. Gdańsk: Wyd. PG 1993. 3. Raven F.H.: Automatic Control Engineering. McGraw-Hill 1988. 4. Dokumentacja techniczna: Programowalny sterownik S7-1200 Podręcznik systemu. Wydanie 04/2009.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Analyze the water level control system in the tank. Design a heating control system in the production hall. Develop alarm algorithms in the turbogenerator control system.		
Work placement	Not applicable		