



## Subject card

Subject name and code	Automatics of industrial process, PG_00059838						
Field of study	Automation, Robotics and Control Systems						
Date of commencement of studies	February 2025	Academic year of realisation of subject			2025/2026		
Education level	second-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
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						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	15.0	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		0.0		0.0	30
Subject objectives	The aim of the course is to provide theoretical and practical knowledge in the field of designing automated technological processes in industrial conditions with the use of professional computer hardware and engineering software.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_K05] can think and act in an entrepreneurial way						
	[K7_K04] is able to react in abnormal and emergency situations, health and life-threatening when use of automation and robotics components and systems						
	[K7_U08] has the necessary preparation to work in an industrial environment, carry out research, apply principles of health and safety at work						
Subject contents	Examples of industrial processes, formulating aims and tasks for industrial process control systems and technical problems in their implementation. Types and ways of describing selected objects and technical processes, their specific properties as well as static and dynamic characteristics. Control structures: open and closed systems, systems with feedback from output values and from the process status, with a reference model, with a status estimator. Types of industrial control devices: continuous PID controllers, two-position and three-position controllers with correction, stepper, fuzzy and predictive controllers. Selection of control, measuring and executive devices. Designing industrial process control systems using PLC controllers.						
Prerequisites and co-requisites	Knowledge of the subject Basics of Automation						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	Project	100.0%			40.0%		
	Lecture	50.0%			60.0%		

Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Kaczorek T., Dzieliński A., Dąbrowski W., Łopatka R.: Podstawy teorii sterowania. PWN, Warszawa 2016.</li> <li>2. Tatiewski P.: Sterowanie zaawansowane obiektów przemysłowych. Struktury i algorytmy. EXIT, Warszawa 2016.</li> <li>3. Mikulczyński T., Samsonowicz Z., Więclawek R.: Automatyzacja procesów produkcyjnych. WNT, Warszawa 2015.</li> <li>4. Kwiecień R.: Komputerowe systemy automatyki przemysłowej. Helion, Gliwice 2013.</li> <li>5. Bubnicki Z.: Teoria i algorytmy sterowania, Wydawnictwo Naukowe PWN, Warszawa 2002.</li> <li>6. Kasprzyk J.: Programowanie sterowników przemysłowych. PWN, Warszawa 2017.</li> <li>7. Fudali M.: Przewodnik po technologiach przemysłu 4.0. Wyd.: Elamed Media Group, Katowice 2021.</li> <li>8. Kasprzyk J.: Wieloetapowe sterowanie rozmyte, Wydawnictwo Naukowo - Techniczne, Warszawa 2001.</li> </ol>
	Supplementary literature	<ol style="list-style-type: none"> <li>1. Ogata K.: Modern Control Engineering. 4th edition. Prentice Hall, New Jersey 2002.</li> <li>2. Goodwin G.C., Graebe S.F., Salgado M.E.: Control Systems Design, Prentice Hall. 2001.</li> <li>3. Czemplik A.: Modele dynamiki układów fizycznych dla inżynierów. WNT, Warszawa 2008.</li> <li>4. Pięgat A.: Modelowanie i sterowanie rozmyte. EXIT, Warszawa 1999.</li> <li>5. Findeisen W.: Technika regulacji automatycznej. PWN, Warszawa 1976.</li> </ol>
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	<p>Types and ways of describing selected industrial processes.</p> <p>Types of industrial measuring, control and executive devices.</p> <p>Methods of selection of control devices</p>	
Work placement	Not applicable	

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