



Subject card

Subject name and code	Automation of Technological Processes, PG_00048433						
Field of study	Automatic Control, Cybernetics and Robotics						
Date of commencement of studies	February 2022	Academic year of realisation of subject				2021/2022	
Education level	second-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	1	Language of instruction				Polish	
Semester of study	1	ECTS credits				3.0	
Learning profile	general academic profile	Assessment form				exam	
Conducting unit	Department of Automatic Control -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Piotr Kaczmarek				
	Teachers		dr inż. Piotr Fiertek dr inż. Piotr Kaczmarek				
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	15.0	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	6.0	24.0	75		
Subject objectives	Introduction for automation of technological processes						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_W03] Knows and understands, to an increased extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum.	Student can analyze complex production processes.			[SW1] Assessment of factual knowledge		
	[K7_W21] Knows and understands, to an advanced extent, methods and techniques of design and operation of automatic control systems, control and robotics systems, as well as the use of computers in the control and monitoring of dynamic objects	The student can design complex control systems based on feedback, cascade control and feedforward			[SW1] Assessment of factual knowledge		
	[K7_U09] can carry out a critical analysis of the functioning of existing technical solutions and assess these solutions, as well as apply experience related to the maintenance of advanced technical systems, devices and facilities typical for the field of studies, gained in the professional engineering environment	The student can design IT systems supporting business and production processes			[SU1] Assessment of task fulfilment		

Subject contents	1. Definition of mechanization and automation 2. Benefits of automation 3. Factors of automation 4. Automation in a machine-building industry 5. Production techniques in a machine-building industry 6. Components of manufacturing process 7. Automation of a simple manufacturing cycle 8. Automation of a machine feeding process 9. Automation of a workshop transport 10. Automation of a assembly process 11. Numerically controlled machine tools 12. Robots in automatic production processes 13. Quality control in automatic manufacturing systems 14. Computer aided design in automatic manufacturing systems 15. CRM/ MRP/ERP systems 16. CAD/CAM/CAE software 17. Automation in chemical industry 18. Control of heat and mass transfer processes 19. Design of control systems for chemical reactions 20. Automation of rectification and distillation processes														
Prerequisites and co-requisites															
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="448 360 794 398">Subject passing criteria</th> <th data-bbox="794 360 1141 398">Passing threshold</th> <th data-bbox="1141 360 1487 398">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 398 794 432">Project</td> <td data-bbox="794 398 1141 432">51.0%</td> <td data-bbox="1141 398 1487 432">40.0%</td> </tr> <tr> <td data-bbox="448 432 794 465">Written test</td> <td data-bbox="794 432 1141 465">51.0%</td> <td data-bbox="1141 432 1487 465">30.0%</td> </tr> <tr> <td data-bbox="448 465 794 499">Seminar</td> <td data-bbox="794 465 1141 499">51.0%</td> <td data-bbox="1141 465 1487 499">30.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Project	51.0%	40.0%	Written test	51.0%	30.0%	Seminar	51.0%	30.0%
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Written test	51.0%	30.0%													
Seminar	51.0%	30.0%													
Recommended reading	Basic literature	B. Roffel, B. Betlem "Process Dynamics and Control" Wiley 2006 M. Piekarski, M. Poniewski "Dynamika i sterowanie procesami wymiany ciepła i masy" Warszawa WNT, 1994													
	Supplementary literature	No requirements													
	eResources addresses														
Example issues/ example questions/ tasks being completed															
Work placement	Not applicable														