

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Computer-based Control Systems, PG_00053910							
Field of study	Informatics							
Date of commencement of studies	October 2024		Academic year of realisation of subject			2026/2027		
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			3.0		
Learning profile	general academic profile		Assessment form			assessment		
Conducting unit	Department of Decision Systems and Robotics -> Faculty of Electronics, Telecommunications and Informatics							
Name and surname	Subject supervisor	dr inż. Marek	Tatara					
of lecturer (lecturers)	Teachers		dr inż. Marek	Tatara				
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM
of instruction	Number of study hours	15.0	0.0	30.0	0.0		0.0	45
	E-learning hours inclu	Ided: 0.0						
Learning activity and number of study hours	Learning activity Participation in classes include plan		I didactic Participation in consultation hours		Self-study SUM		SUM	
	Number of study hours	45		4.0		26.0		75
Subject objectives	The aim of the course is to master the knowledge of methods of mathematical modeling of dynamic processes serving as objects submitted for control.							
Learning outcomes	Course outcome		Subject outcome			Method of verification		
	[K6_U07] can apply methods of process and function support, specific to the field of study		Student is able to use methods supporting processes and functions, specific to automation			[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
	[K6_W03] knows and understands, to an advanced 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		The student understands the structure and principles of operation of components and control systems, theories, methods and relationships between them as well as selected specific issues regarding signal processing systems and automation			[SW1] Assessment of factual knowledge		
Subject contents	 Basics of digital signal processing and control. 2. Characteristics of discrete signals and systems; methods of analysis. 3. Basic properties of discrete-time systems and methods of description. 4. Z transformation, deterministic signals, multi-dimensional transformations. 5. Modified Z transformation, inverse Z transformation. Applications. 6. Theory of linear discrete systems: Controllability, observability. 7. Similarity transformations, properties of similar systems. 8. Basic structures of linear discrete-time systems 9. Analysis and synthesis of digital control systems: making system dis-crete and analog (discretization and analogization); continuous and discrete modeling 10. Analog to digital processing (ADC conversion)and analogization); continuous and discrete modeling 11. Deterministic and probabilistic approaches to tuning ADC 12. Digital to analog processing (DAC conversion): Rules of conversion (decoding and signal generation) No requirements 							
and co-requisites								

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade		
	Practical exercise	50.0%	40.0%		
	Written exam	50.0%	60.0%		
Recommended reading	Basic literature	W.L. Brogan: Modern control theory, Prentice Hall, Englewood Cliffs, 1974			
	Supplementary literature	Z. Kowalczuk: Dyskretne modele w projektowaniu układów sterowania, Zesz. Nauk. PG, vol. 78, no. 493, 1992			
	eResources addresses	Adresy na platformie eNauczanie:			
Example issues/ example questions/ tasks being completed					
Work placement	Not applicable				

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