



Subject card

Subject name and code	Random Processes - Theory for the Practician, PG_00047507						
Field of study	Automatic Control, Cybernetics and Robotics						
Date of commencement of studies	February 2024	Academic year of realisation of subject			2023/2024		
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			English		
Semester of study	1	ECTS credits			2.0		
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		prof. dr hab. inż. Maciej Niedźwiecki				
	Teachers		prof. dr hab. inż. Maciej Niedźwiecki				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	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		4.0		16.0	50
Subject objectives	Students taking this course get acquainted with the basic methods of description and analysis of random processes, as well as with chosen practical applications of this methods						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U03] can design, according to required specifications, and make a complex device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment		Students are able to describe random processes and know the methods of controlling linear objects subjected to random interference.		[SU3] Assessment of ability to use knowledge gained from the subject		
	[K7_W02] Knows and understands, to an increased extent, selected laws of physics and physical phenomena, as well as methods and theories explaining the complex relationships between them, constituting advanced general knowledge in the field of technical sciences related to the field of study		Students are able to describe random processes and know the methods of controlling linear objects subjected to random interference.		[SW3] Assessment of knowledge contained in written work and projects		
Subject contents	<ol style="list-style-type: none"> 1. Scalar random variables and their characteristics 2. Central limit theorem 3. Selected classes of random variables (uniform, Gauss, Laplace, Cauchy) 4. Pairs of random variables and their characteristics 5. Principles of independent component analysis 6. Vector random variables 7. Examples of random processes 8. Characteristics of random processes 9. Ergodicity of random processes 10. Spectral analysis of random processes 11. Linear transformations of random processes 12. Elimination of noise from signals - spectral subtraction approach 						

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written exam	50.0%	40.0%
	Practical task 1 (source separation)	50.0%	30.0%
	Practical task (denoising)	50.0%	30.0%
Recommended reading	Basic literature	S.L. Miller, D.G. Childers: "Probability and random processes", Academic Press, 2004.	
	Supplementary literature	No requirements	
	eResources addresses	Adresy na platformie eNauczenie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		