GDAŃSK UNIVERSITY OF TECHNOLOGY

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 2023	Academic year of realisation of subject	2022/2023
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_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
[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

Subject contents

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. Pronciples of independent component analysis
6. Vector random variables
7. Examples of random processes
8. Characteristics of random processe
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
Practical task (denoising)	50.0%	30.0%
Practical task 1 (source separation)	50.0%	30.0%
Written exam	50.0%	40.0%

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 eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	