GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Random Processes - Theory for Practitioners, PG_00064516
Field of study	Automatic Control, Cybernetics and Robotics

Date of commencement of studies	February 2026	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	Optional subject group Specialty 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	assessment

Conducting unit	Department Of Automatic Control -> Faculty Of Electronics Telecommunications And Informatics -> Wydziały Politechniki Gdańskiej

Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Marcin Ciołek
	Teachers	dr inż. Marcin Ciołek

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	15.0	0.0	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	Basic methods of describing and analyzing random processes, as well as with selected practical applications of these 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 can describe random processes	[SW1] Assessment of factual knowledge
	[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 can describe random processes	[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools

Subject contents	1. Scalar random variables and their characteristics2. Central limit theorem3. Selected classes of random variables (uniformly distributed, Gaussian, Laplace, Cauchy variables)4. Pairs of random variables and their characteristics5. Basics of independent component analysis6. Vector random variables7. Examples of random processes8. Characteristics of random processes9. Ergodicity of random processes10. Spectral analysis of random processes11. Linear transformations of random processes12. Removing noise from signals - spectral subtraction method
Prerequisites and co-requisites	

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project	50.0%	30.0%
	Computer Exercises	50.0%	0.0%
	Exam	50.0%	70.0%

Recommended reading	Basic literature	S.L. Miller, D.G. Childers: "Probability and random processes", Academic Press, 2004.
	Supplementary literature	S.L. Miller, D.G. Childers: "Probability and random processes", Academic Press, 2004.
	eResources addresses	Adresy na platformie eNauczanie:

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

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