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 2027	Academic year of realisation of subject	2026/2027
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 -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Marcin Ciołek	
	Teachers	dr inż. Marcin Ciołek	

Lesson types

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_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	[SU4] Assessment of ability to use methods and tools [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 can describe random processes	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Course content – lecture

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</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Exam</td><td>50.0%</td><td>70.0%</td></tr>
<tr><td>Computer Exercises</td><td>50.0%</td><td>0.0%</td></tr>
<tr><td>Project</td><td>50.0%</td><td>30.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>S.L. Miller, D.G. Childers: "Probability and random processes", Academic Press, 2004.</td></tr>
<tr><td>Supplementary literature</td><td>S.L. Miller, D.G. Childers: "Probability and random processes", Academic Press, 2004.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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