

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Field of study Informatics Date of commencement of studies Octor 2025 Academic year of realisation of subject Octor 2025 Education level first-cycle studies Subject group Obligatory subject group related to scientified of study Mode of study Part-time studies Mode of delivery at the university Year of study 2 Language of instruction Polish Semester of study 4 ECTS credits 4.0 Learning profile general academic profile Assessment form assessment Conducting unit Department of Telenformation Networks - Faculty of Electronics Telecommunications and Informatics - Wydziaty Politechnik Grahekie Name and surmame of lecturer (lecturers) Eeson type Lecture Tutorial Lesonatory Project Seminar SUM Number of study hours Learning nours included: 0.0 Elearning nours included: 0.0 Elearning nours included: 0.0 Elearning nours included: 0.0 Elearning nours included: 0.0 SUM Learning outcomes Knowledge of basic methods of one-and multidimensional random variable analysis. Subject outcome Subject outcome Subject outcome S	Subject name and code	Basics of Probability Methods, PG_00058914									
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knowledge to formulate and solve complex and non-typical problems related to the field of study and perform tasks, in an innovative way, in not entirely predictable conditions, by:n- appropriate selection of sources and information obtained from them, assessment, critical analysis and synthesis of this information,n- selection and application of appropriate methods and toolsn Issue methods and tools [SU1] Assessment of task fulfilment IK6_W01] knows and understands, to an advanced extent, mathematics necessary to related to the field of study related to the field of study The student describes the basic types of random processes and knows methods for calculating the basic parameters characterizing discrete and continuous random variables. [SW3] Assessment of knowledge contained in written work and projects Subject contents 1. Definition of random event, algebra of events 2. Combinatorics. Definitions of the probability. 3. Conditional probabilities, independent events. 4. Law of total probability, Bayes theorem. 5. Definitions of continuous and discrete random variables, definition and properties of curulative distribution function. 6. Definition and properties of probability density function. 7. Multidimensional random variables of areas implementation of discrete RV distributions: exponential, Raylegh, Gauss. Gauss distribution of multidimensional RV. 13. Functions of RV and their probability, Gauss distribution of multidimensional RV. 14. Definition of rale second Tchebyschev inequalities, Markov large number theorem, limit theorem. 15. Entropy of discrete RV. Prerequisites No requirements	Learning outcomes	Course out	ect outcome		Method of verification						
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		Conditional probabilities, independent events. 4. Law of total probability, Bayes theorem. 5. Definitions of continuous and discrete random variables, definition and properties of cumulative distribution function. 6. Definition and properties of probability density function. 7. Multidimensional random variables (MRV): distribution function, marginal distributions. 8. Conditional distributions . 9. Mean value and variance of RV: definition, properties. Higher order statistical moments of RV. 10. Moments of multidimensional RV, mixed moments, correlation coefficient, covariance coefficient, covariance matrix. 11. Examples of areas implementation of discrete RV distributions; two-point, binomial , Poisson, geometric. 12. Examples of areas implementation of continuous RV distributions: exponential, Rayleigh, Gauss. Gauss distribution of multidimensional RV. 13. Functions of RV and their probability distribution. 14. Definitions of limits of RV sequences, first and second Tchebyschev inequalities, Markov large number theorem, limit theorem. 15. Entropy of discrete RV.									
		No requirements									

Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade			
and criteria	activity	0.0%	10.0%			
	Midterm colloquium	50.0%	90.0%			
Recommended reading	Basic literature	Sobczak W., Konorski J., Kozłowska J.: Probabilistyka stosowana, wyd. PG, 2004r.				
	Supplementary literature	A. Papoulis.: Probability, Random Variables and Stochastic Process, McGraw-Hill, 1991				
	eResources addresses					
Example issues/ example questions/ tasks being completed	Example problem: Random variable probability density function is given by the formula p(x)=Cexp(-2x) for x>0. Calculate the constant C, cumulative dystributon function, the mean value and variance of random variable X.					
	Example question: Write and prof Tchebyschev inequalities.					
Work placement	Not applicable					

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