

Subject card

Subject name and code	Probability Theory, PG_00155279						
Field of study	Mathematical Modeling and Data Analysis						
Date of commencement of studies	October 2024		Academic year of realisation of subject			2025/2026	
Education level	Bachelor's studies		Subject group			Obligatory subject group in the field of study	
Mode of study	full-time studies		Mode of delivery			at the university	
Year of study	2		Language of instruction			Polish	
Semester of study	4		ECTS credits			8.0	
Learning profile	academic		Assessment form			exam	
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Filip Strobin				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	60.0	0.0	0.0	0.0	90
	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	90		15.0		95.0	200
Subject objectives	The aim of the course is to familiarize students with the basic concepts of probability theory.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[MMiADL3_U08] is able to plan a way to solve a given problem and make a correct record of this solution, providing accurate and precise justifications for the correctness of their reasoning	verifies basic properties of probability spaces and random variables and proves simple facts about probability spaces and random variables	[SU4] test/exam - oral or written
	[MMiADL3_U09] is able to use the learned software package or the learned programming language to solve selected problems from the known fields, in particular from mathematical analysis, linear algebra and statistics	can visualize selected aspects of random experiences	[SU8] observation of student's independent or team work
	[MMiADL3_K10] is ready to analyse data and communicate the conclusions of such analysis in an accessible form	is ready to analyze data from a probabilistic perspective and communicate the conclusions from such analysis in an accessible form	[SK8] observation of student's independent or team work
	[MMiADL3_W09] knows and understands the basics of computational and programming techniques supporting mathematician's work and understands their limitations	can visualize and understand selected aspects of random behaviour	[SW4] test/exam - oral or written
	[MMiADL3_W08] knows and understands well the role and importance of proof in mathematics, as well as the concept of the significance of assumptions	knows and understands the basic concepts, theorems and methods of probability theory	[SW4] test/exam - oral or written
	[MMiADL3_K02] is ready to precisely formulate questions to deepen his/her own understanding of a given topic or to find missing elements of reasoning	can formulate precise questions that serve to deepen one's understanding of a topic or identify missing elements of reasoning	[SK8] observation of student's independent or team work
	[MMiADL3_K06] is ready to formulate opinions on basic mathematical issues	can formulate opinions on basic mathematical issues related to probability theory	[SK8] observation of student's independent or team work
	[MMiADL3_W04] knows the basic concepts, methods and theorems of the theory of probability and statistics, and basic examples both illustrating specific concepts in these areas, and allowing to refute incorrect hypotheses or unauthorized reasoning	knows and understands the basic concepts, theorems and methods of probability calculation, as well as examples illustrating these concepts and allowing to refute erroneous hypotheses or unjustified reasonings	[SW4] test/exam - oral or written
	[MMiADL3_U04] correctly uses the concepts of probability theory and statistics, is able - at a simple and medium level of difficulty - to apply the theorems and methods of these fields, and is able to interpret the results obtained	verifies selected properties of probability spaces and random variables and proves selected facts concerning probability spaces and random variables	[SU4] test/exam - oral or written
	[MMiADL3_K04] is ready to understand and appreciate the importance of intellectual honesty in own and other people's actions; is ready to act ethically	Understands and appreciates the importance of intellectual honesty in one's own and others' actions; acts ethically	[SK8] observation of student's independent or team work
	[MMiADL3_K01] is ready to accept the limitations of his/her own knowledge and understands the need for further education	knows the limitations of his own knowledge and understands the need of further education	[SK8] observation of student's independent or team work
	[MMiADL3_U07] can comprehensively, in speech and in writing, formulate definitions and theorems and present correct mathematical reasoning regarding the issues learned	verifies basic properties of probability spaces and random variables and proves simple facts about probability spaces and random variables	[SU4] test/exam - oral or written
	[MMiADL3_W07] knows and understands the construction of mathematical theories, can use mathematical formalism to build and analyse simple mathematical models in other fields of science	knows and understands the basic concepts, theorems and methods of probability theory	[SW4] test/exam - oral or written

Subject contents	1. Probability space.		
	2. Conditional probability and independence.		
	3. Random variable, probability distribution, cumulative distribution function.		
	4. Independence of random variables.		
	5. Expected value and variance of a random variable.		
	6. Limit theorems.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	n/a	51.0%	50.0%
	n/a	100.0%	0.0%
	n/a	51.0%	50.0%
Recommended reading	Basic literature	1. J. Jakubowski, R. Sztencel Wstęp do teorii prawdopodobieństwa, SCRIPT Warszawa 2001; 2. Plucińska, E. Pluciński, Probabilistyka: Rachunek prawdopodobieństwa. Statystyka matematyczna. Procesy stochastyczne, Wydawnictwa Naukowo - Techniczne Warszawa 2000. 3. W.. Kryszicki i in. Rachunek prawdopodobieństwa i statystyka matematyczna w zadaniach 4. J. Jakubowski, R. Sztencel, Rachunek prawdopodobieństwa dla (prawie) każdego, SCRIPT Warszawa 2006;	
	Supplementary literature	1. G. Krzykowski, M. Szreder Rachunek prawdopodobieństwa i statystyka matematyczna 2. M. Krzyśko, Wykłady z teorii prawdopodobieństwa, WNT Warszawa 2000; 3. R. Bartoszyński, D. Niewiadomska-Bugaj Probability and Statistical Inference 4. Freund, Miller, Miller John E. Friends Mathematical Statistics with Applications	
	eResources addresses		
	Example issues/ example questions/ tasks being completed	lack	
Work placement	Not applicable		

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