

PROBABILISTIC METHODS AND STATISTICS

Faculty of Computer Science				
Study programme:	Computer Science		Degree level:	Engineer's degree full-time programme
Specialization	---		Diploma path:	2026/2027W - 2026/2027S
Module name:	Probabilistic Methods and Statistics (Metody probabilistyczne i statystyka)			
Module type:	obligatory	Semester: 2	ECTS:4	Module ID:FCS-00055
No. of hrs in semester:	Lecture (L) - 30 Classes(C) - 0 Specialization workshop (SW) - 30 Project (P) - 0 Laboratory classes (LC) - 0 Seminar (S) - 0			
Prerequisites	Linear Algebra (FCS-00030), Calculus (FCS-00002), Discrete Mathematics (FCS-00054),			
Aims and objectives:	The aim of the subject is to acquaint students with basic definitions and problems of probability and mathematical statistics.			
Forms of teaching activities::	lecture, specialization workshop,	Assessment:	Evaluation must be relevant to the intended learning outcomes:	
		Lecture - written test; exercises - tests, work on classes; specialistic workshop - evaluation of reports, short tests.		
Module content:	Lecture: random events, random variables, probability distributions, parameterization of probability distributions, correlation and regression, sampling, estimation, testing of hypotheses. Exercises: combinatorics, random events, discrete and continuous random variables, numerical characteristics of random variables, functions of random variables, two-dimensional random variables. Sw: descriptive statistics, estimators, hypothesis testing, analysis of variance, regression analysis.			
Teaching methods:	subject exercises, informative lecture,			
Learning outcomes				
Symbol	Specify min. 4, max. 8 learning outcomes in the following order: knowledge - skills - competence. Each learning outcome must be verifiable		Reference to the programme learning outcomes of education	
LO1	can describe and put into practice the basic concepts of probability theory.			
LO2	can calculate numerical characteristics of random variables, define their probability distributions them and examine their interaction.			
LO3	correctly describes the concepts associated with the estimation and statistical inference.			
LO4	is able to characterize the analyzed problem using descriptive statistics and to verify the hypothesis with properly selected statistical models.			
No. of learning outcome	Methods of assessing the learning outcome		Type of teaching activities (if more than one) during which the outcome is assessed	
LO1	test, work on classes		L	
LO2	test, work on classes		L	
LO3	test, short tests		L, Sw	
LO4	test, raports		L, Sw	
Student's workload (in hours)	1 - Attendance at lectures	None	30	
	2 - Attendance at specialistic workshop classes	None	30	
	3 - Preparation for tests	None	10	
	4 - Preparation for classes and specialistic workshops	None	20	
	5 - Preparation for the test	None	10	
		TOTAL:		100
Quantitative indicators	Student's workload - activities that require direct teacher participation: (2)+(1)	60	ECTS 2.4	
	Student's workload connected with practical classes (2)+(4)+(3)	60	2.4	
Basic references:	1. R.L. Scheaffer, Probability and statistics for engineers, Boston : Brooks/Cole : Cengage Learning, 2011 2. R. Bartoszyński R., J. Koronacki, J. Zieliński, Mathematical statistics, Warszawa : Państwowe Wydawnictwo Naukowe, 1980.			
Further reading	1. L. J. Bain, Introduction to Probability and Mathematical Statistics, Duxbury Classic Series, 2000			
Unit:	Software Department	Lecturer/ instructor		
Date of issuing the programme:	31st March 2026	Author of the programme:		dr inż. Magdalena Topczewska

L - lecture, C - classes, LC - laboratory classes, P-project, SW - specialization workshop, S - seminar

