Study programme(s): Applied Mathematics (MAP)

Course title: PROBABILITY (P401)

Lecturer(s): Danijela Rajter Ćirić

Course status: compulsory

ECTS points: 6

Requirements: Differential and Integral Calculus

Learning Objectives

Introducing students to the basic notions of probability theory and its practical applications.

Learning Outcomes

Mastering the basic notions of probability theory.

Syllabus

Theoretical instructions

Random events, definitions and properties of probabilities. Conditional probabilities, independence. The Borel-Cantelli lemmas. Total probability formula, Bayes formula. Random variables, discrete and absolutely continuous random variables. Cumulative distribution functions. Moivre-Laplace's theorem. Multidimensional random variables, marginal distributions. Independence of random variables, conditional distributions. Transformation of random variables. Numerical characteristics of one-dimensional and two-dimensional random variables. Conditional expectations, regression. Characteristic functions. Convergence of sequences of random variables. Laws of large numbers. The central limit theorem.

Practical instructions

Tasks and problems in practical teaching follow the content of theoretical instructions with a special focus on practical applications of probability theory in industry, economy, etc.

Literature

1. D. Rajter Ćirić, **Verovatnoća**, drugo dopunjeno izdanje, PMF, Novi Sad, 2009.
2. Z. Lozanov-Crvenković, D. Rajter, **Zbirka rešenih zadataka iz verovatnoće i statistike**, PMF, Novi Sad 1999.
3. M. Merkle, P. Vasić, **Verovatnoća i statistika**, Elektrotehnički fakultet, Beograd, 1998.
4. Kenneth Lange, **Applied Probability**, Springer Texts in Statistics, 2nd ed., 2010.

Number of active classes	**Lectures: 2**	**Exercises: 3**

Teaching methods

Classical teaching methods are used in lectures. During the exercises students practice the exposed principles and analyze typical problems and their solutions.

Grading (maximum number of points 100)

Pre-exam obligations	Points	**Final exam**	Points
colloquia	**50**	oral exam	**50**