Course: Probability theory and stochastics processes

Teacher(s): Danijela Reiter-Ćirić, Marija Milošević

Course status: elective

ECTS: 12

Prerequisites: -

Goal

Mastering the concepts and results of probability theory and stochastic processes and learning about the possibilities of their applications.

Outcomes

Students will master the basics that enable research work on problems within stohastic analysis and gain insight into the possibilities of applying acquired knowledge to problems in other fields of science and practice.

Contents

Theoretical teaching

- 1. Mathematical theory of probability theory
- 2. Probability and conditional expectations
- 3. Convergence of random variable sequences
- 4. Characteristic functions. Multidimensional Normal Distribution
- 5. Finite-dimensional distribution functions of stochastics processes
- 6. Separability, measurability and continuity of stochastics processes
- 7. Gaussian process. Processes with independent increasements
- 8. Stochastic second-class processes and Riemman integral. Stationary processes
- 9. Ergodicity. Diffusion processes. Martingales

Practical teaching

Solving problems from Probability Theory and Stohastian Processes

Recommended bibliography

- 1. Shiryaev, A.N. Probability, Second Edition, y Springer Science+Business Media New York, 1996.
- 2. Karatzas, I., Shreve, S.E., Brownian Motion and Stochastic Calculus, Springer-Verlag, 1988.
- **3.** Gihman, I.I., Skorohod, A.V., Introduction to the Theory of Random Processes, Nauka, Moscow, 1977.

Active teaching hours: Theoretical: 4 Practical: Methods of teaching Independent work of students in practical classes Icctures and independent work of students in practical classes Knowledge estimation: (max 100 points) 50 pre-exam obligations, 50 exam