

Study programmes: Doctoral studies – Mathematics – Probability and statistics			
Course name: Statistics of stochastic processes			
Lecturers: Jelena Jocković, Pavle Mladenović			
Status: Optional			
ECTS: 9			
Attendance prerequisites: Theory of stochastic processes, Mathematical statistics			
Course aims: Acquiring general and specific knowledge concerning statistics of stochastic processes.			
Course outcome: Upon completing the course, a student is capable of applying the acquired knowledge and conducting individual scientific research in this field.			
Course content: Optimal nonlinear filtration of stochastic processes. Fundamental theorem. Equation of optimal nonlinear filtration. Filtering of diffusion Markov processes. Equation of optimal nonlinear interpolation. Equation of optimal nonlinear extrapolation. Stochastic differential equations with partial derivatives for the conditional density. Optimal filtering. Optimal filtering of Markov processes with countable number of states. Problem of optimal nonlinear interpolation. Forward and backward equations. Problem of optimal nonlinear extrapolation. Optimal linear non-stationary filtration. Kalman-Bucy method. Equations of optimal linear non-stationary filtration. Applications of equations of optimal nonlinear filtrations to control theory. Applications to information theory.			
Literature: Р.Ш. Липцер, А.Н. Ширяев, <i>Статистика случайных процессов</i> , Наука, Москва, 1974.			
Number of hours : 10	Lectures: 4	Research: 6	
Teaching and learning methods: Frontal / Individual			
Assessment (maximal 100 points)			
Course assignments	points	Final exam	points
homework	20	Written exam	
Exercises / Tutorials		Oral exam	60
Colloquia			
Essay/Project	20		