

<b>Study programmes:</b> Doctoral studies – Mathematics – Probability and statistics			
<b>Course name:</b> Stochastic differential equations			
<b>Lecturers:</b> Bojana Milošević, Pavle Mladenović, Jelena Jocković			
<b>Status:</b> Optional			
<b>ECTS:</b> 9			
<b>Attendance prerequisites:</b> Theory of stochastic processes, Probability measures on metric spaces			
<b>Course aims:</b> Acquiring general and specific knowledge concerning stochastic differential equations			
<b>Course outcome:</b> Upon completing the course, a student is capable of applying the acquired knowledge and conducting individual scientific research in this field.			
<b>Course content:</b> Probability measures on metric spaces. Conditional mathematical expectation. Continuous stochastic processes adapted to an increasing family of sub $\sigma$ -fields. Martingales. Brownian motion. Poisson random measure. Point processes and Poisson point processes. Ito's definition of stochastic integrals. Stochastic integrals with respect to martingales. Stochastic integrals with respect to point processes. Semi-martingales. Ito's formula. Martingale characterization of Brownian motions and Poisson point processes. Representation theorem for semi-martingales. Stochastic differential. Stochastic differential with respect to quasimartingales. Definition of solution of stochastic differential equation. Existence theorem. Uniqueness theorem. Diffusion processes and stochastic differential equations. Stochastic differential equations with boundary conditions. Stochastic differential equations with respect to Poisson point processes.			
<b>Literature:</b> N. Ikeda, S. Watanabe, <i>Stochastic Differential Equations and Diffusion Processes</i> , North-Holland Publishing Company, Amsterdam, 1981.			
<b>Number of hours :</b> 10	<b>Lectures:</b> 4	<b>Research:</b> 6	
<b>Teaching and learning methods:</b> Frontal / Individual			
<b>Assessment (maximal 100 points)</b>			
<b>Course assignments</b>	points	<b>Final exam</b>	points
homework	20	Written exam	
Exercises / Tutorials		Oral exam	60
Colloquia			
Essay / Project	20		