Course: Stochastic differential equations	
Teacher(s): Miljana Jovanović, Marija Milošević	
Course status: elective	
ECTS: 12	
Prerequisites: -	

Goal

Acquiring knowledge in theory of stochastic differential equations.

Outcomes

The students will be able to do their individual research in the area of stochastic integration and stochastic differential equations, as well as to apply their knowledge in other disciplines.

Contents

Theoretical teaching

- Brownian motion.
- Ito stochastic integral.
- Ito formula, moment inequalities.
- Stochastic differential equations. Existence and uniqueness of solution.
- Caratheodory and Cauchy-Maruyama approximations of solutions.
- Linear stochastic differential equations.
- Ito processes. Girsanov theorem.
- Stochastic integrals and stochastic differential equations with respect to martingales and martingale measures.
- Functional stochastic differential equations.

Practical teaching

Implementation of the theoretically analyzed methods.

Recommended bibliography

1. X. Mao, Stochastic Differential Equations and their Applications, Horwood Publishing Chichester, 2007.
2. I. Karatzas, S. Shreve, Brownian Motion and Stochastic Calculus, Springer, Berlin, 1991.
3. N. Ikeda, S. Watanabe, Stochastic Differential Equations and Diffusion Processes, North-Holland, 1981.
4. B. Oksendal, Stochastic Differential Equations, Springer, 2000.

Active teaching hours:	Theoretical: 4	Practical:

Methods of teaching

Theoretical lectures and independent work of students during practical hours.

Knowledge estimation: (max 100 points)

50 points on pre-exam and 50 points on oral exam