Study programme(s): Mathematics (MD)

Level: PhD studies

Course title: Generalized stochastic processes (AN-13a)

Lecturer: Danijela Rajter-Ćirić, Dora Seleši

Status: elective

ECTS: 10

Requirements:

Learning objectives

Making students familiar with fundaments of stochastic analysis and generalized stochastic processes.

Learning outcomes

Acquiring full knowledge in the theory of classical and generalized stochastic processes and their relationship with the theory of deterministic generalized functions.

Syllabus

Spaces of generalized functions. Positive measures. Fundaments of stochastic analysis: conditional expectation, Brownian motion, white noise, stochastic integration, martingales. Gaussian processes, Poisson processes and Levy processes. Some classes of generalized stochastic processes: Gelfand-Vilenkin processes, Colombeau processes etc.

Literature

1. S. Pilipović, D. Seleši, *Mera i integral – fundamenti teorije verovatnoće*, Zavod za udžbenike, 2012.
2. W. Rudin, *Real and Complex Analysis*, McGraw-Hill , 1987
3. Gregory F. L., *Introduction to Stochastic Processes*, Second Edition, Chapman and Hall, 2006
4. Z. Brzezniak, T. Zastawniak, *Basic stochastic processes*, Springer undergraduate Mathematics series, Springer – Verlag, 2006.
5. I. M. Gel'fand, N. Ya. Vilenkin, *Generalized functions*, Volume 4, Academic Press, 1964.
6. Nedeljkov, M., Pilipović, S., Scarpalezos, D., *Linear Theory of Colombeau's Generalized Functions*, Addison Wesley, Longman, 1998.

Weekly teaching load				Other: 0
Lectures: 2	Exercises 0	Other forms of teaching: 0	Student research: 6	

Teaching methodology

Plenary lectures, problem sessions, independent presentations carried out by students.

Grading method (maximal number of points 100)			
Pre-exam obligations	**points**	**Final exam**	**points**
Colloquia	50	Oral exam	50