Study programmes: PhD studies – Mathematics (Probability and statistics)

Course name: Theory of stochastic processes

Lecturers: Pavle N. Mladenović, Slobodanka Janković

Status: Optional (except for the students of the module Statistics, actuarial and financial mathematics)

ECTS: 9

Attendance prerequisites: no prerequisites

Course aims: Acquiring knowledge in the field of stochastic processes necessary for successful scientific research.

Course outcome: Upon completion of the course, student is familiar with various types of stochastic processes, their importance in applications, and is capable of involving in scientific research in this field.

Course content:

Probability in infinite-dimensional space. Family of finite-dimensional distributions that are generated by a stochastic process. Sequences of independent random variables and stationary sequences. Processes with uncorrelated or orthogonal values. Discrete-time Markov chains. Continuous-time Markov chains. Martingales. Processes with independent increments. Processes with orthogonal increments. Stationary sequences. Continuous-time stationary processes. The best linear forecast of wide -sense stationary stochastic processes.

Literature:

1. **А.В. Булинский, А.Н. Ширяев,** ***Теория случайных процессов***, ФИЗМАТЛИТ, Лаборатория Базовых Знаний, Москва, 2003.

2. **J.L. Doob,** ***Stochastic Processes***, John Wiley & Sons, New York, Chapman & Hall, London, 1953.

3. **Jovan Mališić:** ***Slučajni procesi***, Građevinska knjiga, Beograd, 1989.

4. **M. Rosenblatt,** ***Random Processes,*** Springer-Verlag, New York, 1974.

Number of hours: 10	**Lecures: 4**	**Tutorials and research: 6**	**Laboratory:**

Teaching and learning methods: Frontal / Lectures / Exercises

Assessment (maximal 100 points)

Course assignments	points	Final exam	points
Lectures	-	Written exam	-
Exercises / Tutorials	20	Oral exam	-
Colloquia	-	Written-oral exam	60
Essay / Project	20		