Study programme(s): Applied Mathematics – Data Science

Level: master studies

Course title: Stochastic processes

Lecturer: Danijela Z. Rajter-Ćirić

Status: obligatory

ECTS: 6

Requirements: none

Learning objectives

Becoming familiar with the basic concepts of stochastic analysis, stochastic differential equations and its applications.

Learning outcomes

After taking and learning the content of the subject, student should possess the basic knowledge in the area, and to get the ability to apply it in the other subjects and areas

Syllabus

Theoretical instruction

Overview of basic probability theory. Conditional expectation - definion and properties. Stochastic processes. Classes of stochastic processes and their properties. Markov processes. Poisson process. Wiener processes. White noise process. Martingales.

Practical instruction

Problem solving sessions.

Literature

S. Ross, *Introduction to probability models*, eight edition, Academic Press, 2003.

L. Evans, *An introduction to stochastic differential equations, version 1.2*, Department of Mathematics, UC Berkeley.

S. Roman, *Introduction to the Mathematics of Finance, From Risk Management to Options Pricing*, Springer-Verlag, 2004.

Jovan Mališić, *Random processes*, Gradjevinska knjiga, Belgrade, 1989. (in Serbian)

Weekly teaching load				Other: 0
Lectures: **2**	Exercise: **3**	Other forms of teaching: 0	Student research: 0	

Teaching methodology

Lectures are presented using classical teaching methods. Exercises are used to practice and analyse typical problems and their solutions. The abillity of application of theoretical knowledge is checked through independent solving of exercises on two colloquia. The final exam is oral and a student is supposed to demonstrate general understanding of the presented theoretical material.

Grading method (maximal number of points 100)

Pre-exam obligations	**points**	**Final exam**	**points**
Colloquia	50	Oral exam	50