Program	Level	Second cycle		
	Name of the program	Applied Mathematics		
COURSE				
Course title	**Stochastic Processes**			
Course code	Semester	Course status	ECTS	Contact hours (L+AE+LE)
AMAT 475	II	Mandatory course	7	3+2+0
Lecturer				
Course Goals	This course introduces students to some topics in advanced probability theory such as martingales, continuous time random processes, Ito stochastic integral and derivative.			
Learning Outcomes	Upon succsseful completion of the course students will be able to understand: - probability theory on a deeper level, - the most important types of random processes and how to apply them, - concepts of Ito stochastic integral and derivative.			

COURSE CONTENT

- Conditional probability and conditional expectation. Properties of conditional expectation, conditional probability distribution.
- Martingales, submartingales, supermartingales and their properties.
- Stopping time. Doob's inequality and convergence theorems for martingales.
- The notion of random process. Continuous random processes and Kolmogorov's theorem.
- Gaussian processes.
- Existence and properties of the Wiener process.
- Poisson process and applications.
- Random orthogonal measures and integral with respect to random orthogonal measure.
- Ito stochastic integral and classes of Ito integrable functions.
- Second-order stationary processes and infinitely divisible processes.
- Levy process. Ornstein-Uhlenbeck process.
- Stochastic differential and Ito's formula.

LITERATURE

[1] L. Smajlović, Stohastički procesi (skripta), 2013.

[2] N. V. Krylov, Introduction to the Theory of Random Processes, Graduate Studies in Mathematics, Vol. 43, AMS, Providence, Rhode Island, 2002.

[3] S. Ross, Stohastic Processes, J. Wiley, New York, 1996

STUDENT WORKLOAD (hours in a semester)

Lectures	45	Exercises	30	Individual work	90	T o t a l	165

GRADING			**REMARKS**
Criterion	Maximum points	Minimum points	
Midterm exams	50	25	
Final exam	50	30	
T o t a l	100	55	