

Study programme: PhD studies – Mathematics			
Course name: Ergodic Theory			
Lecturer: Pavle Mladenović, Jelena Jocković			
Status: Optional for the module Statistics, actuarial and financial mathematics			
ECTS: 9			
Attendance prerequisites: Stochastic processes			
Course aims: Learning objective is: getting acquainted with general and specific results in the field of ergodic theory.			
Course outcome: Student has obtained skills, competence and knowledge in the field of ergodic theory. Student is trained to achieve independence in scientific research in this area.			
Course content: Measure-preserving transformations. Ergodicity. Statement of the ergodic theorem. Consequences of the ergodic theorem. Proof of the ergodic theorem. The maximal ergodic theorem. An existence theorem. Ergodicity and extreme points. Application to continued fractions. Dynamical systems. Smooth dynamical systems on smooth manifolds. Smooth dynamical systems on the torus. Dynamical systems of algebraic origin. Billiards. Dynamical systems in number theory. Dynamical systems in probability theory. Examples of infinite dimensional dynamic systems.			
Literature: Patrick Billingsley: <i>Ergodic Theory and Information</i> , John Wiley & Sons New York - London - Sydney 1965. I. P. Cornfeld, S. V. Fomin, Ya. G. Sinai: <i>Ergodic Theory</i> , Springer-Verlag New York 1982.			
Number of hours: 10	Lectures: 4	Study research project: 6	
Teaching and learning methods: Group or individual tutorials.			
Assessment (maximal 100 points)			
Course assignments	Number of points	Final exam	Number of points
Homework	20	Written exam	-
Exercises / Tutorials	-	Oral exam	60
Colloquia	-	Written-oral exam	-
Tests	-		
Essay / Project	20		