

Study programme: PhD studies – Mathematics			
Course name: Risk Theory			
Lecturer: Pavle Mladenović			
Status: Optional for the module Statistics, actuarial and financial mathematics			
ECTS: 9			
Attendance prerequisites: Stochastic processes, Extreme value theory			
Course aims: Learning objective is: getting acquainted with general and specific results in the field of risk theory and possibilities of applications in actuarial mathematics.			
Course outcome: Student has obtained skills, competence and knowledge in the field of risk theory. Student has also become acquainted with the modelling in actuarial mathematics. Student is trained to achieve independence in scientific research in this area.			
Course content: The Cramér-Lundberg model. Models for the claim number process. The Poisson process. The renewal process. The generalized Poisson process. Claim size distributions. The distribution of the total claim amount. Ruin theory for heavy-tailed distributions. Subexponential distributions. The total claim amount in the subexponential case. The Cramér-Lundberg theory for large claims. Fluctuations of sums. The central limit problem. The functional CLT and Brownian motion. Fluctuations of maxima and other upper order statistics. Statistical methods for extremal events. Tail and quantile estimation.			
Literature: Paul Embrechts, Claudia Klüppelberg, Thomas Mikosch: <i>Modelling Extremal Events for Insurance and Finance</i> , Springer-Verlag Berlin-Heidelberg 2012. Thomas Mikosch: <i>Non-Life Insurance Mathematics</i> , Springer-Verlag Berlin Heidelberg 2009.			
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		