

Study programme(s): Applied mathematics (MB)				
Level: master				
Course title: Actuarial Mathematics (MB-22)				
Lecturer: Dora Đ. Seleši				
Status: elective				
ECTS: 7				
Requirements: passed exam in course: <i>Stochastic Analysis</i>				
Learning objectives Acquiring basic knowledge and skills in actuarial mathematics and learning the contemporary actuarial models that are used in insurance companies.				
Learning outcomes At the end of the course, students should demonstrate comprehension and knowledge of theoretical fundamentals as well as practical skills and competence needed for a further career in e.g. insurance companies.				
Syllabus <i>Theoretical instruction</i> Types of insurable risks: property insurance, life insurance, pension funds. Principles of premium calculation. Classes of random variables and their distribution laws. Models for the number of claims and severity of the claims. Individual and aggregate risk models. The Panjer recursion theorems. Impact of deductibles and policy limits onto the number of claims and insurance payments. Reinsurance. Statistical methods for optimal model selection. Credibility theory: American and European credibility models. Ruin theory: the Lundberg model, integro-differential equations and approximation with Brownian motion. Extreme risk models. <i>Practical instruction</i> The exercises follow the topics covered at the theoretical lectures. Solving examples, exercises and real world problems.				
Literature 1. Stuart A. Klugman, Harry H. Panjer, Gordon E. Willmot, <i>Loss Models – From Data to Decisions</i> , Second Edition, John Wiley & Sons Inc., Hoboken, New Jersey, 2004. 2. David C. M. Dickson, <i>Insurance Risk and Ruin</i> , International Series on Actuarial Science, Cambridge University Press, 2005. 3. Newton L. Bowers Jr., Hans U. Gerber, James C. Hickman, Donald A. Jones, Cecil J. Nesbitt, <i>Actuarial Mathematics</i> , Second Edition, The Society of Actuaries, Schaumburg, Illinois, 1997. 4. Promislow D., <i>Fundamentals of Actuarial Mathematics</i> , Wiley, 2006.				
Weekly teaching load				Other:
Lectures: 3	Exercises: 3	Other forms of teaching:	Student research:	
Teaching methodology Lectures are presented using classical teaching methods and occasionally supported by beamer presentations. Exercises are used to practise and analyse typical problems and their solutions, to discuss the topics covered at theoretical lectures and to practically implement actuarial models using computers and statistical software.				

Grading method (maximum number of points 100)			
Pre-exam obligations	points	Final exam	points
Colloquia	50	Oral exam	50