Faculty of Science and Mathematics / MATHEMATICS / ACTUARIAL MATHEMATICS

Course:	ACTUARIAL MATHEMATICS			
Course ID	**Course status**	**Semester**	**ECTS credits**	**Lessons** (Lessons+Exercises+Laboratory)
12071	Mandatory	2	5	3+1+0
Programs	MATHEMATICS			
Prerequisites	There is none			
Aims	To adopt the basic terms from the theory of non-life insurance and to be able to apply the theory in practice.			
Learning outcomes	Students will be able to: 1. Explain the basic concepts of financial mathematics and probability theory 2. Derive the basic formulas of actuarial mathematics. 3. Calculate the final and initial values of financial rents 4. Distinguish between financial rents and rents in actuarial mathematics. 5. Solve life insurance problems in different insurance models.			
Lecturer / Teaching assistant	Darko Mitrovic			
Methodology	Lectures, exercises, consultations, homework.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Introduction to the subject. Base model.			
I week exercises	Introduction to the subject. Base model.			
II week lectures	Homogeneous Poisson process, intensity function, Kramer-Lundberg model.			
II week exercises	Homogeneous Poisson process, intensity function, Kramer-Lundberg model.			
III week lectures	Markov property. Relation between homogeneous and inhomogeneous Poisson process.			
III week exercises	Markov property. Relation between homogeneous and inhomogeneous Poisson process.			
IV week lectures	Renewal processes.			
IV week exercises	Renewal processes.			
V week lectures	Expectation, dispersion and asymptotics in renewal processes.			
V week exercises	Expectation, dispersion and asymptotics in renewal processes.			
VI week lectures	The first colloquium			
VI week exercises	Solving tasks from the first colloquium			
VII week lectures	Lectures - recapitulation of material.			
VII week exercises	Exercises - recapitulation of material.			
VIII week lectures	Distribution of demand.			
VIII week exercises	Distribution of demand.			
IX week lectures	Distributions of total demand.			
IX week exercises	Distributions of total demand.			
X week lectures	Numerical methods for calculating the distribution of total demand.			
X week exercises	Numerical methods for calculating the distribution of total demand.			
XI week lectures	Risk processes, probability of bankruptcy and profit.			
XI week exercises	Risk processes, probability of bankruptcy and profit.			
XII week lectures	Lundbergs inequality.			
XII week exercises	Lundbergs inequality.			
XIII week lectures	Bayesian estimates. Heterogeneous model.			
XIII week exercises	Bayesian estimates. Heterogeneous model.			
XIV week lectures	Second colloquium.			
XIV week exercises	Solving tasks from the second colloquium.			

XV week lectures	Linear Bayesian model.
XV week exercises	Linear Bayesian model.
Student workload	Classes and final exam: 20/3 x 16 = 106 hours and 40 minutes Necessary preparations before the beginning of the semester (administration, registration, certification) 2 x 20/3 = 13 hours and 20 minutes Total workload for the course 5x30 = 150 hours Supplementary work for exam preparation in the make-up exam period, including taking the make-up exam from 0 to 30 hours (remaining time from the first two items to the total workload for the course 150 hours) Load structure: 106 hours and 40 minutes (Teaching) + 13 hours and 20 minutes (Preparation) + 30 hours (Additional work)

Per week	**Per semester**
5 credits x 40/30=6 hours and 40 minuts 3 sat(a) theoretical classes 0 sat(a) practical classes 1 excercises **2 hour(s) i 40 minuts** of independent work, including consultations	Classes and final exam: **6 hour(s) i 40 minuts x 16 =106 hour(s) i 40 minuts** Necessary preparation before the beginning of the semester (administration, registration, certification): **6 hour(s) i 40 minuts x 2 =13 hour(s) i 20 minuts** Total workload for the subject: **5 x 30=150 hour(s)** Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) **30 hour(s) i 0 minuts** Workload structure: **106 hour(s) i 40 minuts (cources), 13 hour(s) i 20 minuts (preparation), 30 hour(s) i 0 minuts (additional work)**
Student obligations	Students are required to attend classes and do colloquiums.
Consultations	Monday 14:00-16:00
Literature	T. Mikosch. Non-Life Insurance Mathematics, Springer, 2006.
Examination methods	The maximum number of points on each colloquium is 30, and on the final exam it is 40. The minimum number of points for the passing grade is 51.
Special remarks	None
Comment	None

Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points