

Faculty of Economics / ECONOMICS / Actuarial Mathematics

Course:	Actuarial Mathematics			
Course ID	Course status	Semester	ECTS credits	Lessons (Lessons+Exercises+Laboratory)
4175	Mandatory	1	7	2+0+0
Programs	ECONOMICS			
Prerequisites	-			
Aims	The course is the base for the in the Actuary department			
Learning outcomes	After completion of this course the student will be able to: 1. Describe the calculation base in tariffs calculation of life insurance and calculate the discount factor in insurance- technical sense. 2. Define the biometric functions, the intensity of mortality, expected and probable life duration. 3. Calculate net and gross premiums for the various types of life insurance. 4. Establish tariffs in property insurance. 5. Calculate the premium reserve in 4 ways. 6. Explain the methods of determining reserves for losses and retention. 7. Define and determine a solvency margin and assess the rating of insurance companies.			
Lecturer / Teaching assistant	Vladimir Kaščelan full professor, TA Milan Raičević			
Methodology	Lectures with the active participation of students. It is planned two tests.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Technical organization of insurance. Characteristics and type of life insurance.Technical bases of life insurance			
I week exercises	Technical organization of insurance. Characteristics and type of life insurance.Technical bases of life insurance			
II week lectures	Computational bases for tariff calculations in life insurance.			
II week exercises	Computational bases for tariff calculations in life insurance.			
III week lectures	Tariff calculation (net premiums) for different types of life insurance			
III week exercises	Tariff calculation (net premiums) for different types of life insurance			
IV week lectures	Biometric functions. Mortality rate. Expected and probable life duration			
IV week exercises	Biometric functions. Mortality rate. Expected and probable life duration			
V week lectures	Gross premium calculation in life insurance. One and case of more than one annual premium			
V week exercises	Gross premium calculation in life insurance. One and case of more than one annual premium			
VI week lectures	Insurance at two lives. Probability of life and death of two persons. Commutative numbers. Joint whole life annuity-due. Pure endowment. Whole life insurance. Endowment			
VI week exercises	Insurance at two lives. Probability of life and death of two persons. Commutative numbers. Joint whole life annuity-due. Pure endowment. Whole life insurance. Endowment			
VII week lectures	Determination of tariffs in non-life insurance			
VII week exercises	Determination of tariffs in non-life insurance			
VIII week lectures	Test no. 1			
VIII week exercises	Test no. 1			
IX week lectures	Premium reserve			
IX week exercises	Premium reserve			
X week lectures	Retrospective and prospective net method of premium reserve calculation. Zillmer's method			
X week exercises	Retrospective and prospective net method of premium reserve calculation. Zillmer's method			
XI week lectures	Recursion relations. Saving and risk premium			
XI week exercises	Recursion relations. Saving and risk premium			
XII week lectures	Methods for loss reserves calculation in non-life insurance. Self-retention and methods for its calculation			
XII week exercises	Methods for loss reserves calculation in non-life insurance. Self-retention and methods for its			

	calculation					
XIII week lectures	Solvency margin. Rating of insurance companies					
XIII week exercises	Solvency margin. Rating of insurance companies					
XIV week lectures	Test no. 2					
XIV week exercises	Test no. 2					
XV week lectures	Make-up tests					
XV week exercises	Make-up tests					
Student workload	per week 7 credits x 40/30 = 9.33 pm Structure: 4 hours of lectures 5.33 hours of independent work, including consultations. per semester per semester Total workload for the course 7x30 = 210 hours Structure: Lectures and final exam: 9.33x16weeks = 149.28 hours Preparation before the start of the semester (administration): 9.33x2 = 18.66 hours. Additional work to prepare for and take the make-up exam 42.06 hours.					
Per week			Per semester			
7 credits x 40/30=9 hours and 20 minuts 2 sat(a) theoretical classes 0 sat(a) practical classes 0 excercises 7 hour(s) i 20 minuts of independent work, including consultations			Classes and final exam: 9 hour(s) i 20 minuts x 16 =149 hour(s) i 20 minuts Necessary preparation before the beginning of the semester (administration, registration, certification): 9 hour(s) i 20 minuts x 2 =18 hour(s) i 40 minuts Total workload for the subject: 7 x 30=210 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) 42 hour(s) i 0 minuts Workload structure: 149 hour(s) i 20 minuts (courses), 18 hour(s) i 40 minuts (preparation), 42 hour(s) i 0 minuts (additional work)			
Student obligations			Students are required to attend classes			
Consultations			after lectures			
Literature			Kočović J.: Aktuarske osnove formiranja tarifa u osiguranju lica EF-Beograd 2000; Kaščelan V. Novović M: Osiguranje i aktuarska matermatika, Univerzitet Crne Gore, 2009.; Kaščelan V.: Osnove aktuarske matematike-skripta EF 2004. Selection from a variet			
Examination methods						
Special remarks						
Comment						
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