Ann	ex No. 3	First Cycle Studi	es Course	Programme			
1.	Course Title	Financial and Actuary Mathematics					
2.	Code	MST 430					
3.	Study programme						
4.	Organizer of the study programme (university unit i.e. institute, chair, department)	Ss. Cyril and Methodius University in Skopje Faculty of Economics - Skopje Chair of Mathematics and Statistics					
5.	Level (first, second, third cycle)	First cycle					
6.	Academic year / semester	2022-2023 8 th (summer semester)	7.	Number of ECTS credits	7.5		
8.	Professor	Prof. Igor Ivanovs	ski, PhD				
9.	Preconditions for None enrolment						
10.	Course Objectives (Com	petencies):					
	After taking this course, st		ole to:				
	6			l models and their applic	cation in long-		
	term financial oper			11	U		
			nd combin	ed models in finance, ba	anking and		
	insurance operatio			,	C		
	3. Understand the ad		ontinuous i	interest			
	4. Get acquainted with	th the technical basi	is of the ins	surance mechanism, type	es and		
		niums and technical					
				reating life insurance pr	oducts		
				nethods and models nece			
	preparing economic and financial analysis, planning and calculations of insurance tariffs and premiums.						
11.	Course content:						
	I. Interest calculation	on models					
	1. Complex interest a	account					
	1.1. Discreet a	nd continuous inter	est calculat	tion			
	1.2. Relative, c	conform, and effect	ive interest	rate			
	1.3. Accumula	ted value of capital					
	II. Periodic investme	ents					
	1. Constant investme	ents					
	1.1. Decursive peri	odical investments					
	1.2. Anticipative p	eriodical investmen	ts				
	1.3. Reconciling the investment with the interest						
	2. Variable periodical investments						
	III. Periodic income (rents)						
	1. Constant rent						
	1.1. Sum of the discounted value of rents						
	2. Variable rent						
	3. Eternal and lifetime rent						
	IV. Models of loan ar						
	1. Equal and rounded annuities						
	2. Variable annuities						
	2.1. Successive variable annuities						
	2.2. Periodical variable annuities						
	3. Amortization of loans divided into bonds						
	4. Equal and variable repayments						
	5. Relationships between the elements of the amortization plan						

V. Anticipative interest calculation I. Nominal, relative, equivalent and effective rate 2. Periodical investments and rents 3. Loan amortization with anticipative interest rate VI. Combined models of Ioan amortization with variable annuities VI. Combined models of Ioan amortization with variable annuities VI. One-time premium for certain types of annuities and equity insurance 1. Comutie numbers and mortality tables VIII. One-time premium for certain types of annuities and equity insurance 1. Capital insurance in case of living 2. Lifetime premium for certain types of annuities and equity insurance 1. Citeration methods for premium reserves 1. Calculation methods for premium reserve 2. Natural, risk and savings premium 3. Combined examples 12. Learning methods: Interactive lectures, video presentations, guest speakers, case studies, directed discussions, individual or group papers, seminar projects, and homework. 13. Total hours 7.5 FCTS x 30 classes 14. Allocation of hours per activities 16.1. 15. Exercises (Geminars) 30 classes		V. Anticipative inte	rost colculation					
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21. Evaluation method Internal evaluation and survey	20.							
	21.	Evaluation method						

	Literature							
22.		Compulsory literature						
	22.1.	No.	Author	Title	Publisher	Year		
		1.	Janev, Drage	Financial and Actuary Mathematics	Faculty of Economics - Skopje	2016		
		2.	Janev, Drage & Ivanovski, Igor	Actuary models of life insurance	Faculty of Economics - Skopje	2014		
		Additional literature						
		No.	Author	Title	Publisher	Year		
	22.2.	1.	Booth, Philip et al.	Modern Actuary Theory and Practice, 2 nd Edition	Chapman & Hall	2005		