

COURSE NAME		FINANCIAL MATHEMATICS			
Code	PMM306	Year of study	3 rd year of undergraduate study 1st / 2nd year of graduate study		
Course teacher	Ana Perišić	Credits (ECTS)	5		
Associate teachers		Type of instruction (number of hours)	L	S	E
			30		30
Status of the course	ELECTIVE COURSE	Percentage of application of e-learning	30%		
COURSE DESCRIPTION					
Course objectives	An introduction to fundamental concepts of financial mathematics required for understanding and correct interpretation of mathematical models in finance. Acquiring essential financial modelling skills through presentation of applied mathematical techniques in financial practice covered by many examples.				
Course enrolment requirements and entry competences required for the course					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>Students will be able to:</p> <ul style="list-style-type: none"> - explain the concept of the time value of money, - differentiate between nominal, proportional and effective interest rate, - calculate and interpret present and future values of cash flows, - construct amortization schedules for different loan repayment methods, - apply basic capital budgeting techniques, - demonstrate knowledge of modern portfolio theory, - construct the efficient frontier, - evaluating bonds, bond portfolios and evaluating options, - applying different risk assessment techniques, - carrying out basic calculations in financial mathematics in a computer-supported way, 				
Course content broken down in detail by weekly class schedule (syllabus)	<p>Lectures/Exercises:</p> <ol style="list-style-type: none"> 1. Time value of money, simple and compound interest types of interest rates. (2h/2h) 2. Present and future values of cash flows; general annuities, perpetuities, continuous interest. (2h/2h). 3. Loan. Different loan repayment methods. Rescheduled loans. (2h/2h). 4. Intercalary interest. Effective interest. (2h/2h). 5. Capital budgeting techniques (2h/2h). 6. Bond: value, price, yield and duration. Duration of a portfolio of bonds. (2h/2h) 7. Immunization. Modeling the term structure (2h/2h). 8. Fundamental concepts of modern portfolio theory, portfolio means and variances, variance-covariance matrix. (2h/2h). 9. Efficient portfolios, efficient frontier, CAPM. (3h/3h). 10. Asset risk. Portfolio risk (2h/2h). 11. Basic option definitions and terminology. Option payoff and profit patterns, option arbitrage propositions (3h/3h). 12. The Binomial Option-Pricing Model (2h/2h). 13. The Black-Scholes Model (2h/2h). 14. Option Greeks (2h/2h). 				
Format of instruction	<p>x lectures</p> <p>X exercises</p> <p>x individual work</p>				

Student responsibilities	Attending lectures, writing homework and writing a seminar assignment.					
Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	Attending lectures	0.1	Research		Practical	0.5
	Experimental work		Report			
	Essay		Seminar assignment	1		
	Colloquium	3* (colloquium or written exam)	Oral exam	0.4		
	Written exam	3* (colloquium or written exam)	Project			
Grading and evaluating student work in class and at the final exam	Attending lectures, writing homework, writing a seminar assignment, written and oral exam. During the semester, students have the possibility to partially take written exams through colloquia (twice during the semester). Students who pass both colloquia don't need to take part in the written exam.					
Required literature (available in the library and via other media)	Title		Items in library		Available other	
	through resources					
	Z. Babić, N. Tomić-Plazibat, Z. Aljinović, <i>Matematika u ekonomiji</i> , Sveučilište u Zagrebu, 2009				No	
	B. Šego, Z., Lukač, <i>Financijska matematika</i> , Sveučilište u Zagrebu, 2011.				No	
Z. Aljinović, B. Marasović, B. Šego, <i>Financijsko modeliranje</i> , Sveučilište u Splitu, 2011.				No		
Optional literature (at the time of submission of study programme proposal)	J. Cvitanić, F. Zapatero, <i>Economics and Mathematics of Financial Markets</i> , The MIT Press, 2004 S. Benninga, <i>Financial modeling</i> , 3rd ed, The MIT Press, Cambridge, 2008 Šegota, A. <i>Financijska matematika</i> , Sveučilište u Rijeci, 2012. Babić, Z., Tomić-Plazibat, N., <i>Poslovna matematika</i> , Ekonomski fakultet, Split, 2004.					
Quality assurance methods that ensure the acquisition of exit competences	Summarizing test results and conducting an anonymous student survey at the end of the course. The survey is conducted according to the rules of the University of Split.					
Other (as the proposer wishes to add)						