NAME OF THE COURSE	Financial modeling					
Code	EUB320	Year of study	First			
Course teacher	Prof Zdravka Aljinović Dr Branka Marasović, Associated Professor Dr Tea Poklepović, Assistant Professor	Credits (ECTS)	5			
Associate teachers	Tea Kalinić, mag math	Type of instruction (number of hours)	L	S	E	F
			26		26	
Status of the course	Obligatory/optional	Percentage of application of e-learning	40			

COURSE DESCRIPTION

Course objectives	Enable entering the world of practitioners from the financial – banking and funds industry.
Course enrolment requirements and entry competences required for the course	Good knowledge of Excel and affinity to quantitative methods in economics.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	To value and manage stocks, options, and bonds and their portfolios. Particular outcomes: 1. To construct efficient frontiers for stocks' and/or mixed portfolios; 2. To evaluate risks with different risk measures; 3. To evaluate options; 4. To create option strategies and to manage the taken positions; 5. To evaluate bonds and to manage bonds' portfolios; 6. To construct the yield curve.

Course content broken down in detail by weekly class schedule (syllabus)

Lectures		Exercises:	
Topic	Hours	Topic	Hours
Basics of the Modern Portfolio Theory; Portfolio Mean and Variance, Calculating the Variance – Covariance Matrix.	2	Basics of the Modern Portfolio Theory; Portfolio Mean and Variance, Calculating the Variance – Covariance Matrix.	2
Theoretical framework of the Markowitz' model, the minimum variance set, efficient portfolio, efficient frontier – short sale allowed	2	Efficient frontier – short sale allowed	2
Efficient frontier without short sale, CAPM, beta	2	Efficient frontier without short sale. Beta.	2
Value at Risk – VaR; Definition and Characteristics. Stock's VaR, Portfolio's VaR.	2	Stock's VaR, Portfolio's VaR.	2
Options – Basic definitions and terminology; Basic Properties of an Option's Price.	1	Basic Properties of an Option's Price.	1

	Option Strategies; Hedging, Spread, Straddle.	2	Option Strategies; Hedging, Spread, Straddle.	2
	General Restrictions on European and American Option Prices	2	General Restrictions on European and American Option Prices	2
	The Binomial Option Pricing Model	2	The Binomial Option Pricing Model	2
	The Black-Scholes Option Pricing Model	2	The Black-Scholes Option Pricing Model	2
	Option Price Sensitivity Analysis – Greeks	2	Option Price Sensitivity Analysis – Greeks	2
	Bonds: the value of a bond, clean price, accrued interest, dirty price. Duration. Bond yield.	2	Bonds: the value of a bond, clean price, accrued interest, dirty price. Duration. Bond yield.	2
	Bond Portfolio Immunization	2	Bond Portfolio Immunization	2
	The term structure of interest rates – yield curve. The forward rate and forward curve.	2	The term structure of interest rates – yield curve. The forward rate and forward curve.	2
	Nelson-Siegel model. Yield curve approximation.	1	Nelson-Siegel model. Yield curve approximation.	1

Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☒ partial e-learning ☐ field work	☒ independent assignments ☐ multimedia ☐ laboratory ☐ work with mentor ☐ (other)
Student responsibilities	Students are obliged for active participation in the course performance. Student's activity will be observed through 13 independent assignments – exercises in Excel, which will be announced on the Moodle platform through semester. Students are obliged to attend 70% of classes – lectures and exercises, and to have all independent assignments – exercises done and documented on the Moodle platform.	

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)*						
	Class attendance	1.5 ECTS	Research	3 ECTS*	Practical training	3 ECTS*
	Experimental work		Report		Independent assignments	0.5 ECTS
	Essay		Seminar essay	3 ECTS*	(Other)	
	Mid-term exams	3 ECTS*	Oral exam		(Other)	
	Written exam	3 ECTS*	Project		(Other)	

Grading and evaluating student work in class and at the final exam	1. Three mid-term exams during classes. 2. Research/Seminar essay/ Practical training during classes. 3. Exam: written + Excel * The course content is divided into three main parts: stocks, options, bonds. Each part can be passed

	with one mid-term exam; Every mid-term exam includes solving tasks in Excel. The precondition for approaching the mid-term exam is that all independent assignments from the appropriate part are done and documented. Students who pass all three mid-term exams are free of the final exam during exam terms. Exercises as well as exam and mid-term exams are performed on computers. Instead passing mid-term exams, students can make and present Research/Seminar essay/ Practical training for the particular part or for all three parts. Scoring and appropriate marks: 0% - 49% - insufficient (1) 50% - 59% - sufficient (2) 60% - 75% - good (3) 76% - 90% - very good (4) 91% - 100% - excellent (5)

	Title	Number of copies in the library	Availability via other media
Required literature (available in the library and via other media)	Aljinović, Z., *Financial modeling*, authorized lectures, University of Split, Faculty of Economics		Web page of the course
	Benninga, S., *Financial modeling*, 3rd ed, The MIT Press, Cambridge, 2008	1	

Optional literature (at the time of submission of study programme proposal)	Dalton, B., *Financial Products, An Introduction Using Mathematics and Excel*, Cambridge University Press, NY, 2008 Hull, J.C., *Options, Futures and Other Derivatives*, 9th ed, Pearson Education Limited, Harlow, 2018
Quality assurance methods that ensure the acquisition of exit competences	Registering students' attendance and success in carrying out of their duties (lecturer). Monitoring lectures and practice sessions (Vice Dean for Education). Students' Performance analysis in each course (Vice Dean for Education). Student questionnaire on the quality of lecturers and lessons for each course (University of Split, Quality Assurance Centre) Examination is used as an instrument to evaluate individual course outcomes by the course lecturer. The content of exam is reassessed periodically in order to assure compliance with the course outcomes.
Other (as the proposer wishes to add)	