Ekonomski fakultet / BUSINESS AND ECONOMICS / MATHEMATICS FOR BUSINESS AND ECONOMICS

Naziv predmeta:	MATHEMATICS FOR BUSINESS AND ECONOMICS			
Šifra predmeta	**Status predmeta**	**Semestar**	**Broj ECTS kredita**	**Fond časova** (P+V+L)
14296	Obavezan	1	8	2+2+0
Studijski programi za koje se organizuje	BUSINESS AND ECONOMICS			
Uslovljenost drugim predmetima	-			
Ciljevi izučavanja predmeta	The subject is basic course which aims to enable students to understand the basic definitions, theorems, principles and methods of Mathematical Economics in order to help them to understand other quantitative disciplines such as: Financial and Actuarial Mathematics, Microeconomics, Statistics, Operational Researches, ...			
Ishodi učenja	After completion of this course the student will be able to: 1. Calculate a value of determinant and specify it properties. 2. Solve exercises with a matrix, conduct basic arithmetic operations with matrices and specify their properties. 3. Determine and discuss solutions of system of linear equations and inequalities. 4. Solve exercises including a vector and arithmetic operations with vectors. 5. Examine a function and explain basic concepts of function of one variable, and draw its graph. 6. Calculate a derivative of the function of one variable, interpret it economically and geometrically 7. Calculate and interpret indefinite and definite integrals and apply the definite integral to surfaces calculation and to solve economic problems. 8. Explain basic concepts of several variable, as well as to apply partial derivatives to extreme values determination. 9. Interpret and explain theorems regarding the concepts learned. 10. Apply learned concepts and theorems on economic phenomenon and create a simpler mathematical- economic models including those from the Financial Mathematics.			
Ime i prezime nastavnika i saradnika	Dr Vladimir Kašćelan, Professor Mr Milan Raičević, TA			
Metod nastave i savladanja gradiva				
Plan i program rada				
Pripremne nedjelje	Priprema i upis semestra			
I nedjelja, pred.	Mathematical- economic model. Equilibrium in the economy. Principle and methods of Financial mathematics. Proportion. Percentage. Arithmetic and geometric progression. (2L- Lecture 1) Linear models and matrix algebra- introduction. Matrices. Vectors. Vector space. Linear dependence. Basis. (2L- Lecture 2) NOTICE: In general, each week exercises (2E) follow the lectures (2L), except Week 1: 4L will be held.			
I nedjelja, vježbe	NOTICE: In general, each week exercises (2E) follow the lectures (2L).			
II nedjelja, pred.	Determinants. Inverse matrix. Cramers rule. Application to Market and National-income models. Leontief Input-Output model. (Lecture 3)			
II nedjelja, vježbe				
III nedjelja, pred.	Gaussian algorithm. Rank. Kronecker- Capelli theorem. Convex set. Hyperplane in the n-space. Linear inequality. System of linear inequalities. (Lecture 4)			
III nedjelja, vježbe				
IV nedjelja, pred.	Look at the 1st week			
IV nedjelja, vježbe	Quiz 1- date: 18.10.2023. NOTICE: After the quiz, this week 4E will be held.			
V nedjelja, pred.	The real function of a real variable. Elementary functions- characteristics and graphics. Inverse function. Composite function. Limit of function. Eulers number e. Continuous function. Economic functions. (Lecture 5)			
V nedjelja, vježbe				
VI nedjelja, pred.	Derivative- definition and geometric interpretation. Rules of differentiation- derivation of sum, product and quotient. Differentials. Higher derivatives. (Lecture 6)			
VI nedjelja, vježbe				
VII nedjelja, pred.	Chain rule. Inverse function rule. Marginal function. Elasticity. Growth rate. (Lecture 7) Quiz 2- date: 8.11.2023.			
VII nedjelja, vježbe				

VIII nedjelja, pred.	Mean- value theorems. L' Hospital's rule. Monotonic function. Extreme values. Convexity. Inflection point. (Lecture 8)
VIII nedjelja, vježbe	
IX nedjelja, pred.	Types of function growth. Characteristics of functions. Graph. Exercises. (Lecture 9)
IX nedjelja, vježbe	
X nedjelja, pred.	Indefinite integrals- definition and properties. The substitution rule. Integration by parts. Integration of rational functions. (Lecture 10) Quiz 3- date 29.11.2023.
X nedjelja, vježbe	
XI nedjelja, pred.	Definite integral- definition. Newton-Leibniz formula. Geometric interpretation of definite integral. (Lecture 11) TEST (during 2E)- date: 6.12.2023
XI nedjelja, vježbe	
XII nedjelja, pred.	First- order differential equations. Equations with separated variable. Homogeneous differential equation. First and second order linear differential equations. Discrete time- difference equations. (Lecture 12)
XII nedjelja, vježbe	
XIII nedjelja, pred.	Function of more than one variable (Multivariable calculus). Partial derivatives. Partial and cross-partial elasticity. Total differentials. (Lecture 13) Make-up test (during 2E)- date: 20.12.2023
XIII nedjelja, vježbe	
XIV nedjelja, pred.	Extreme values (free and constrained optimum). Lagrange's function. Homogeneous function. Method of least squares. (Lecture 14) Quiz 4- date 27.12.2023.
XIV nedjelja, vježbe	
XV nedjelja, pred.	Preparation for the final exam.
XV nedjelja, vježbe	
Opterećenje studenta	

Nedjeljno	**U toku semestra**
8 kredita x 40/30=10 sati i 40 minuta 2 sat(a) teorijskog predavanja 0 sat(a) praktičnog predavanja 2 vježbi **6 sat(a) i 40 minuta** samostalnog rada, uključujući i konsultacije	Nastava i završni ispit: **10 sati i 40 minuta x 16 =170 sati i 40 minuta** Neophodna priprema prije početka semestra (administracija, upis, ovjera): **10 sati i 40 minuta x 2 =21 sati i 20 minuta** Ukupno opterećenje za predmet: **8 x 30=240 sati** Dopunski rad za pripremu ispita u popravnom ispitnom roku, uključujući i polaganje popravnog ispita od 0 do 30 sati (preostalo vrijeme od prve dvije stavke do ukupnog opterećenja za predmet) **48 sati i 0 minuta** Struktura opterećenja: **170 sati i 40 minuta (nastava), 21 sati i 20 minuta (priprema), 48 sati i 0 minuta (dopunski rad)**
Obaveze studenta u toku nastave	
Konsultacije	Monday 15:45 (Prof.), Wednesday 11:30 (TA)
Literatura	Alpha C. Chiang Kevin Wainwright Fundamental Methods of Mathematical Economics, 4th edition, McGraw-Hill, 2005.
Oblici provjere znanja i ocjenjivanje	Quizzes (4) 10 points Test 40 points Final exam 50 points
Posebne naznake za predmet	
Napomena	

Ocjena:	F	E	D	C	B	A
Broj poena	manje od 50 poena	više ili jednako 50 poena i manje od 60 poena	više ili jednako 60 poena i manje od 70 poena	više ili jednako 70 poena i manje od 80 poena	više ili jednako 80 poena i manje od 90 poena	više ili jednako 90 poena