UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	**Matematika za ekonomske in poslovne vede**
Course title:	Mathematics for Economics and Business

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Doktorski program ekonomskih in poslovnih ved, tretjestopenjski program	Usmeritev Ekonomija in usmeritev Poslovne vede	1.	1.
Doctoral Program in Economics and Business	Economics and Business track	1.	1.

Vrsta predmeta / Course type	Metodološke osnove / Methodological foundation
Univerzitetna koda predmeta / University course code:	

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje Laboratory work	Druge oblike dela	Samost. delo Individ. work	ECTS
25		25		30	100	6

Nosilec predmeta / Lecturer:	prof. dr. Matjaž Konvalinka

Jeziki / Languages:	**Predavanja / Lectures:**	Angleški/English; Slovenski/Slovenian
	Vaje / Tutorial:	Angleški/English; Slovenski/Slovenian

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
Predmet ne vsebuje pogojev za vključitev.	None

Vsebina:	**Content (Syllabus outline):**
1. Linearna algebra in linearna optimizacija (matrike, sistemi linearnih enačb, Gaussova eliminacija, determinanta, vektorski prostori, linearna neodvisnost, lastne vrednosti in lastni vektorji, diagonalizacija, vektorski prostori s sklarnim produktom, ortonormalna baza, Gram-Schmidtova ortogonalizacija, simetrične matrike, kvadratne forme, linearni programi, simpleksna metoda, dualno dopolnjevanje) 2. Infinitezimalni račun in nelinarna optimizacija (odvod, linearna aproksimacija, parcialni odvod, gradient, nedoločeni integral, substitucija, integriranje po delih, določeni integral, večkratni integral,	1. Linear algebra and linear optimization (matrices, systems of linear equations, Gaussian elimination, determinant, vector spaces, linear independence, eigenvalues and eigenvectors, diagonalization, vector spaces with a scalar product, orthonormal basis, Gram-Schmidt orthogonalization, symmetric matrices, quadratic forms, linear programs, simplex method, complementary slackness) 2. Calculus and nonlinear optimization (derivative, linear approximation, partial derivative, gradient, antiderivative, substitution, integration by parts, definite integral, multiple integral, differential equations with separable variables, linear

diferencialne enačbe z ločljivima spremenljivkama, linearne diferencialne enačbe, klasifikacija linearnih parcialnih diferencialnih enačb drugega reda, lokalni in globalni ekstremi funkcij ene ali več spremenljivk, Lagrangeevi množitelji, konveksni problemi, Karush-Kuhn-Tuckerjevi pogoji) 3. Analiza (izrek o implicitni funkciji, izreki o fiksnih točkah)	differential equations, classification of linear partial differential equations of second order, local and global extrema of functions of one or several variables, Lagrange multipliers, convex problem, Karush-Kuhn-Tucker conditions) 3. Analysis (implicit function theorem, fixed point theorems)

Temeljni literatura in viri / Readings:

Simon, Carl P.; Blume, Lawrence E.: Mathematics for Economists
Mas-Colell, Andreu; Whinston, Michael Dennis; Green, Jerry R.: Microeconomic Theory (mathematical appendix)
Hillier, Frederick S.; Lieberman, Gerald J.: Introduction to operations research

Cilji in kompetence:	**Objectives and competences:**
Cilj predmeta je študentom ponuditi osnovno znanje matematike za samostojno delo na področju ekonomije in poslovnih ved.	The goal of this course is to provide the students with a basic understanding of the main mathematical tools used in business and economics.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Študentje bodo pridobili osnovo za razumevanje snovi iz matematične statistike, napredne ter uporabne ekonometrije ter naprednih poglavij ekonomije in poslovnih ved.	The students will get a firm basis for understanding the problems of mathematical statistics, advanced and applied econometrics and advanced chapters in economics and business.

Metode poučevanja in učenja:	**Learning and teaching methods:**
Predavanja, vaje in samostojno delo na podlagi rednih domačih nalog.	Lectures, exercises and independent work based on regular assignments.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Domače naloge, pisni izpit		Type (examination, oral, coursework, project): Homework problems, written exam

Reference nosilca / Lecturer's references:

prof. dr. Matjaž Konvalinka

1. M. Konvalinka, I. Pak: Triangulations of Cayley and Tutte polytopes, Adv. Math., Vol. 245 (2013), 1-33
2. M. Konvalinka: Skew quantum Murnaghan-Nakayama rule, J. Algebraic Combin., Vol. 35 (4) (2012), 519-545
3. M. Konvalinka, I. Pak: Non-commutative extensions of the MacMahon Master Theorem, Adv. Math., Vol. 216 (1) (2007), 29-61
4. M. Konvalinka: Triangularizability of polynomially compact operators, Integr. equ. oper. theory, Vol. 52 (2) (2005), 271-284
5.The role of residue and quotient tables in the theory of k-Schur functions, J. Combin. Theory Ser. A, Vol. 136 (2015), 1-38