

UČNI NAČRT PREDMETA / COURSE SYLLABUS (leto / year 2017/18)						
Predmet:	Analiza 2					
Course title:	Analysis 2					
Študijski program in stopnja Study programme and level	Študijska smer Study field			Letnik Academic year	Semester Semester	
Interdisciplinarni univerzitetni študijski program Računalništvo in matematika	ni smeri			1	drugi	
Interdisciplinary first cycle academic study programme Computer Science and Mathematics	none			1	second	
Vrsta predmeta / Course type				obvezni / compulsory		
Univerzitetna koda predmeta / University course code:				27204		
Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
45		45			120	7
Nosilec predmeta / Lecturer:				prof. dr. Janez Mrčun, prof. dr. Sašo Strle		
Jeziki / Languages:	Predavanja / Lectures:		slovenski / Slovene			
	Vaje / Tutorial:		slovenski / Slovene			
Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:				Prerequisites:		
Vpis v letnik študija.				Enrolment in the programme.		
Vsebina:				Content (Syllabus outline):		

<p>Integral: nedoločeni integral, osnovna pravila za računanje, določeni integral, zveza med določenim in nedoločenim integralom, posplošeni integral, uporaba integrala.</p> <p>Osnove krivulj in ploskev: podajanje krivulj in ploskev (eksplicitno, implicitno, parametrično, polarno), tangenta na krivuljo, risanje krivulj, dolžina loka.</p> <p>Številске in funkcijske vrste: vrste realnih in kompleksnih števil, absolutna in pogojna konvergenca, testi za konvergenco, alternirajoče vrste, funkcijske vrste, enakomerna konvergenca, odvajanje in integriranje vrst po členih, potenčne vrste, Taylorjeva vrsta, Fourierova vrsta.</p> <p>Osnove diferencialnih enačb: diferencialne enačbe 1. reda (ločljive, eksaktne, linearne), linearne diferencialne enačbe 2. reda.</p>	<p>Integral: indefinite integral, integration rules, definite integral, relation between the definite and indefinite integral, improper integrals, applications of integration.</p> <p>Basics of curves and surfaces: descriptions of curves and surfaces (explicit, implicit, parametric, polar coordinates), tangent to a curve, drawing of curves, arc length.</p> <p>Number and function series: convergence: series of real and complex numbers, absolute and conditional convergence, convergence tests, alternating series, series of functions, uniform convergence, differentiation and integration of series of functions, power series, Taylor series, Fourier series.</p> <p>Elementary differential equations: differential equations of first order (separable, exact, linear), linear differential equations of second order.</p>
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Temeljni literatura in viri / Readings:

<p>Ivan Vidav: Višja matematika I, Ljubljana: DMFA-založništvo, 1994.</p> <p>Gabrijel Tomšič, Bojan Orel, Neža Mramor Kosta: Matematika I, Ljubljana: Založba FE in FRI, 2001.</p> <p>Neža Mramor Kosta, Borut Jurčič Zlobec: Zbirka nalog iz matematike I, Ljubljana: Založba FE in FRI, 2001.</p> <p>Pavlina Mizori-Oblak: Matematika za študente tehnike in naravoslovja, Del 1. Ljubljana: Fakulteta za strojništvo, 1991.</p> <p>James Stuart: Calculus, Brooks/Cole Publishing Company, 1999.</p> <p>M. H. Protter, C. B. Morrey, Intermediate Calculus. Springer-Verlag, New York-Heidelberg, 1985.</p> <p>W. Rudin, Principles of mathematical analysis. McGraw-Hill, Auckland, 1976.</p>

Cilji in kompetence:

Objectives and competences:

Študent spozna osnovne pojme matematične analize kot so integral funkcije ene realne spremenljivke, številske in funkcijske vrste, Taylorjeva in Fourierova vrsta, in spozna osnovne metode reševanj diferencialnih enačb prvega in drugega reda. Analiza 2 sodi med temeljne predmete pri študiju matematike in računalništva.

Student learns the basic concepts of mathematical analysis such as integral of real functions of one real variable, numerical and function series, Taylor and Fourier series, and learns the basic methods for solving differential equations of first and second order. Analysis 2 is one of the fundamental courses of the study of mathematics and computer science.

Predvideni študijski rezultati:

Znanje in razumevanje: Poznavanje in razumevanje osnovnih pojmov, definicij in izrekov.

Uporaba: Analiza 2 sodi med temeljne predmete študijskega programa. Razumevanje snovi predmeta je nepogrešljivo pri mnogih drugih matematičnih in računalniških predmetih na programu.

Refleksija: Razumevanje teorije na podlagi uporabe.

Prenosljive spretnosti - niso vezane le na en predmet: Spretnosti uporabe domače in tuje literature in drugih virov, identifikacija in reševanje problemov, kritična analiza.

Intended learning outcomes:

Knowledge and understanding: Knowledge and understanding of basic notions, definitions and theorems.

Application: Analysis 2 is one of the fundamental courses of the program. Understanding of the material of this course is indispensable for many other mathematics and computer science courses of the program.

Reflection: Understanding the theory from the applications.

Transferable skills: Skills in using the literature and other sources, the ability to identify and solve the problem, critical analysis.

Metode poučevanja in učenja:

Predavanja in vaje, domače naloge.

Learning and teaching methods:

Lectures and tutorial sessions, homework.

Načini ocenjevanja:

Delež (v %) /

Weight (in %) /

Assessment:

2 kolokvija namesto izpita iz vaj, izpit iz vaj, ustni izpit / izpit iz teorije.	50 %	2 midterm exams instead of written exam, written exam, oral exam / theoretical test.
6-10 (pozitivno), in 1-5 (negativno) (po Statutu UL).	50 %	6-10 (pass), 1-5 (fail) (according to the Statute of UL)

Reference nosilca / Lecturer's references:

Janez Mrčun:

MOERDIJK, Ieke, MRČUN, Janez. On the developability of Lie subalgebroids. *Advances in mathematics*, ISSN 0001-8708, 2007, vol. 210, no. 1, str.1-21. [COBISS.SI-ID 14209881]

MRČUN, Janez. On isomorphisms of algebras of smooth functions. *Proceedings of the American Mathematical Society*, ISSN 0002-9939, 2005, vol. 133, no. 10, str. 3109-3113. [COBISS.SI-ID 13782361]

MOERDIJK, Ieke, MRČUN, Janez. On integrability of infinitesimal actions. *American journal of mathematics*, ISSN 0002-9327, 2002, vol. 124, no. 3, str. 567-593. [COBISS.SI-ID 11700057]

Sašo Strle:

RUBERMAN, Daniel, STRLE, Sašo. Concordance properties of parallel links. *Indiana University mathematics journal*, ISSN 0022-2518, 2013, vol. 62, no. 3, str. 799-814. [COBISS.SI-ID 16946265]

OWENS, Brendan, STRLE, Sašo. Dehn surgeries and negative-definite four-manifolds. *Selecta mathematica. New series*, ISSN 1022-1824, 2012, vol. 18, iss. 4, str. 839-854. [COBISS.SI-ID 16808025]

CHA, Jae Choon, KIM, Taehee, RUBERMAN, Daniel, STRLE, Sašo. Smooth concordance of links topologically concordant to the Hopf link. *Bulletin of the London Mathematical Society*, ISSN 0024-6093, 2012, vol. 44, iss. 3, str. 443-450. [COBISS.SI-ID 16807769]