

UČNI NAČRT PREDMETA / COURSE SYLLABUS							
Predmet:		Analiza 3					
Course title:		Analysis 3					
Študijski program in stopnja Study programme and level		Študijska smer Study field		Letnik Academic year		Semester Semester	
Univerzitetni študijski program Finančna matematika		ni smeri		2		prvi	
First cycle academic study programme Financial Mathematics		none		2		first	
Vrsta predmeta / Course type				obvezni			
Univerzitetna koda predmeta / University course code:				M0310			
Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work		ECTS
60		60			150		9
Nosilec predmeta / Lecturer:		prof. Barbara Drinovec Drnovšek, prof. Franc Forstnerič, prof. Pavle Saksida					
Jeziki / Languages:	Predavanja / Lectures:	slovenski/Slovene					
	Vaje / Tutorial:	slovenski/Slovene					
Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:				Prerequisites:			
Opravljen predmeta Analiza 1 in Analiza 2.				Completed courses Analysis 1 and Analysis 2.			
Vsebina:				Content (Syllabus outline):			

Integrali s parametrom, funkciji gama in beta. Dvojni in trojni integral ter najpogostejše uporabe teh integralov. Krivulje in ploskve v prostoru, tangenta na krivuljo, normala na ploskev. Osnovni pojmi metričnih prostorov, izrek o negibni točki. Prostor $\mathbb{R}^n$: metrika, odprte, zaprte množice, zaporedja, kompaktnost, obstoj globalnih ekstremov. Holomorfne funkcije. Integral holomorfne funkcije. Cauchyjev izrek. Razvoj holomorfne funkcije v vrsto. Preproste diferencialne enačbe. Linearne diferencialne enačbe, enostavni sistemi linearnih diferencialnih enačb prvega reda.	Parametric integral, gamma and beta functions. Double and triple integral with most common applications. Curves and surfaces in space, tangent to a curve, normal to a surface. Fundamentals of metric spaces. Fixed point theorem. Space $\mathbb{R}^n$: metric, open and closed sets, sequences, compactness, existence of global extrema. Holomorphic functions. Integral of a holomorphic function. Cauchy theorem. Series expansion of a holomorphic function. Simple differential equations. Linear differential equations. Systems of linear differential equations of the first order.
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Temeljni literatura in viri / Readings:

I. Vidav: Matematika III, DZS, Ljubljana, 1976. M. H. Protter, C. B. Morrey: Intermediate Calculus, New York, Springer, 1985. E. Kreyszig: Advanced Engineering Mathematics, Hoboken, J.Wiley, 2006. S. Lang: Calculus of Several Variables, 3rd edition, Springer, New York, 1996. I. N. Sneddon: Elements of Partial Differential Equations, McGraw-Hill, New York-Toronto-London, 1957. G. Tomšič, T. Slivnik: Matematika III, Založba FE in FRI, Ljubljana, 2001. P. Mizori-Oblak: Matematika za študente tehnike in naravoslovja II, Fakulteta za strojništvo, Ljubljana, 2003. P. DuChateau, D. W. Zachman: Schaum's Outline of Theory and Problems of Partial Differential Equations, McGraw-Hill, New York, 1986.

Cilji in kompetence:

Razširitev osnovnega znanja analize, spoznavanje zahtevnejših pojmov in principov ter njihove uporabe v matematiki, naravoslovju, tehniki in drugih strokah.

Objectives and competences:

Extension of the basic knowledge of analysis, understanding of complex concepts and principles and their application in mathematics, natural science, engineering, and other disciplines.
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Predvideni študijski rezultati:

Znanje in razumevanje: Poznavanje in razumevanje nadaljnjih pojmov diferencialnega in integralnega računa funkcij več spremenljivk in parcialnih diferencialnih enačb. Uporaba: Predmet je nadaljevanje predmetov Analiza 1 in Analiza 2. Obravnavane snovi se kasneje uporabljajo pri večini drugih strokovnih predmetov. Refleksija: Povezovanje osvojenega znanja v okviru predmeta in njegova uporaba na drugih področjih.

Intended learning outcomes:

Knowledge and understanding: Knowledge and understanding of concepts of differential and integral calculus of several variables and partial differential equations. Application: The course is the continuation of Analysis 1 and Analysis 2. The material is later used in most of the professional courses. Reflection: Integration of the acquired knowledge and its application in other areas.
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Prenosljive spretnosti – niso vezane le na en predmet: Jasna postavitve problemov v matematičnem jeziku in izbira primernih metod. Spretnost uporabe domače in tuje literature.

Transferable skills: The ability of clear definition of problems in mathematical language and the choice of appropriate methods. Ability to use domestic and foreign literature.

Metode poučevanja in učenja:

Predavanja, vaje, konzultacije

Learning and teaching methods:

Lectures, exercises, consultations

Delež (v %) /

Weight (in %)

Načini ocenjevanja:

Assessment:

Način (pisni izpit, ustno izpraševanje, naloge, projekt):

2 kolokvija namesto izpita iz vaj, izpit iz vaj,

izpit iz teorije

ocene: 5 (negativno), 6-10 (pozitivno) (po Statutu UL)

50%
50%

Type (examination, oral, coursework, project):

2 midterm exams instead of written exam, written exam

theoretical knowledge exam

grading: 5 (fail), 6-10 (pass) (according to the Statute of UL)

Reference nosilca / Lecturer's references:

Barbara Drinovec Drnovšek:

– DRINOVEC-DRNOVŠEK, Barbara. Proper discs in Stein manifolds avoiding complete pluripolar sets. Mathematical research letters, ISSN 1073-2780, 2004, vol. 11, no. 5-6, str. 575-581

[COBISS.SI-ID 13311065]

– DRINOVEC-DRNOVŠEK, Barbara, FORSTNERIČ, Franc. Approximation of holomorphic mappings on strongly pseudoconvex domains. Forum mathematicum, ISSN 0933-7741, 2008, vol. 20, iss. 5, str. 817-840 [COBISS.SI-ID 15078745]

– DRINOVEC-DRNOVŠEK, Barbara, FORSTNERIČ, Franc. Strongly pseudoconvex domains as subvarieties of complex manifolds. American journal of mathematics, ISSN 0002-9327, 2010, vol. 132, no. 2, str. 331-360 [COBISS.SI-ID 15549529]

Franc Forstnerič:

– FORSTNERIČ, Franc, WOLD, Erlend Fornæss. Fibrations and Stein neighborhoods. Proceedings of the American Mathematical Society, ISSN 0002-9939, 2010, vol. 138, no. 6, str. 2037-2042 [COBISS.SI-ID 15876441]

– FORSTNERIČ, Franc. Stein manifolds and holomorphic mappings : the homotopy principle in complex analysis, (Ergebnisse der Mathematik und ihrer Grenzgebiete, Folge 3, vol. 56). Heidelberg [etc.]: Springer, cop. 2011. X, 489 str., ilustr. ISBN 978-3-642-22249-8. ISBN 978-3-642-22250-4 [COBISS.SI-ID 16008025]

– FORSTNERIČ, Franc. Holomorphic families of long c [sup] 2's. Proceedings of the American Mathematical Society, ISSN 0002-9939, 2012, vol. 140, no. 7, str. 2383-2389 [COBISS.SI-ID 16435289]

Pavle Saksida:

– SAKSIDA, Pavle. Nahm's equations and generalizations Neumann system. Proceedings of the London Mathematical Society, ISSN 0024-6115, 1999, let. 78, št. 3, str. 701-720 [COBISS.SI-ID 8853849]

– SAKSIDA, Pavle. Maxwell-Bloch equations, C Neumann system and Kaluza-Klein theory. Journal of physics. A, Mathematical and general, ISSN 0305-4470, 2005, vol. 38, no. 48, str. 10321-10344 [COBISS.SI-ID 13802073]

– SAKSIDA, Pavle. Lattices of Neumann oscillators and Maxwell-Bloch equations. Nonlinearity, ISSN 0951-7715, 2006, vol. 19, no. 3, str. 747-768 [COBISS.SI-ID 13932377]