

UČNI NAČRT PREDMETA / COURSE SYLLABUS (leto / year 2017/18)						
Predmet:		Diskretne strukture 2				
Course title:		Discrete structures 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:				27205		
Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
45		45			90	6
Nosilec predmeta / Lecturer:				prof. dr. Primož Potočnik, prof. dr. Riste Škrekovski		
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):		

Osnovno o grafih. Drevesa. Eulerjevi in Hamiltonovi grafi. Usmerjeni grafi in turnirji. Povezanost in ravninskost grafov. Barvanje vozlišč in povezav grafa. Osnove algebre: grupe, kolobarji, polinomi, komutativni obsegi.

Basics of graph theory. Eulerian and Hamiltonian graphs. Digraphs and tournaments. Connectivity and planarity. Vertex and edge colorings. Basics of abstract algebra: groups, rings, polynomials, fields.

Temeljni literatura in viri / Readings:

Gašper Fijavž: Diskretne strukture, Fakulteta za računalništvo in informatiko (2015) [elektronski vir], <http://matematika.fri.uni-lj.si/ds/ds.pdf>

Riste Škrekovski: Diskretne strukture II [Elektronski vir] : zapiski predavanj, <http://www.fmf.uni-lj.si/skreko/Gradiva/DS2-skripta.pdf> , ISBN 978-961-92887-3-3, 62 str.

I. N. Herstein, Abstract Algebra, Wiley and sons (1999).

Martin Juvan in Primož Potočnik: Teorija grafov in kombinatorika: primeri in rešene naloge, Društvo matematikov, fizikov in astronomov Slovenije, Ljubljana 2000, ISBN: 961-212-105-2, 173 str.

Cilji in kompetence:

Pri Diskretnih strukturah 2 študent osvoji zahtevnejše vsebine iz teorije grafov in se spozna z osnovami abstraktne algebre.

Objectives and competences:

In Discrete Structures 2 student gains the demanding contents from graph theory and learn the basics of abstract algebra.

Predvideni študijski rezultati:

Znanje in razumevanje: Predmet temelji na znanju, pridobljenem pri Diskretnih strukturah 1. Vsebine predmeta Diskretne strukture 2 so del potrebnega predznanja za predmete Teorija kodiranja in kriptografija, Kombinatorika ter Optimizacijske metode.

Uporaba: Teorija grafov je uporabna v teoriji algoritmov kot orodje za modeliranje raznih problemov. Algebrske strukture se uporabljajo v kriptografiji in kodiranju.

Intended learning outcomes:

Knowledge and understanding: The course is based on the knowledge gained in Discrete Structures 1 The contents of the course Discrete Structures 2 are part of the necessary background knowledge for the courses Coding theory and criptography, Combinatorics and Optimization methods.

Application: Graph theory is useful in the theory of algorithms as a tool for modeling various problems. Algebraic structures used in

Refleksija: Študentje spoznajo razliko med zvezno in diskretno matematiko.

Prenosljive spretnosti - niso vezane le na en predmet: Modeliranje problemov in omrežnih struktur z grafi in drevesi. Obvladanje osnovnih algebrskih struktur.

cryptography and coding.

Reflection: Students learn the difference between continuous and discrete mathematics.

Transferable skills: Modeling problems and network structures with graphs and trees. Mastering basic algebraic structures.

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:

Primož Potočnik:
 POTOČNIK, Primož. Tetravalent arc-transitive locally-Klein graphs with long consistent cycles. European journal of combinatorics, ISSN 0195-6698, 2014, vol. 36, str. 270-281. [COBISS.SI-ID 16862041]

POTOČNIK, Primož, SPIGA, Pablo, VERRET, Gabriel. Cubic vertex-transitive graphs on up to 1280 vertices. Journal of symbolic computation, ISSN 0747-7171, 2013, vol. 50, str. 465-477. [COBISS.SI-ID 16520537]

POTOČNIK, Primož. Edge-colourings of cubic graphs admitting a solvable vertex-transitive group of automorphisms. Journal of combinatorial theory. Series B, ISSN 0095-8956, 2004, vol. 91, no. 2, str. 289-300. [COBISS.SI-ID 13087321]

KAISER, Tomáš, ŠKREKOVSKI, Riste. T-joints intersecting small edge-cuts in graphs. Journal of graph

theory, ISSN 0364-9024, 2007, vol. 56, no. 1, str. 64-71. [COBISS.SI-ID 14373977]

DVOŘÁK, Zdeněk, ŠKREKOVSKI, Riste. A theorem about a contractible and light edge. SIAM journal on discrete mathematics, ISSN 0895-4801, 2006, vol. 20, no. 1, str. 55-61. [COBISS.SI-ID 14249305]

JUNGIĆ, Veselin, KRÁL', Daniel, ŠKREKOVSKI, Riste. Colorings of plane graphs with no rainbow faces. Combinatorica, ISSN 0209-9683, 2006, vol. 26, no. 2, str. 169-182. [COBISS.SI-ID 13954393]