UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Programiranje v diskretni matematiki
Course title:	Programming in discrete mathematics

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Matematika, 2. stopnja	Modul F1	**1. ali 2.**	**1. ali 3.**
Mathematics, 2nd degree	Module F1	**1. or 2.**	**1. or 3.**

Vrsta predmeta / Course type

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
45	**15**		**45**		**165**	**9**

Nosilec predmeta / Lecturer: Andrej Taranenko

Jeziki / Languages:	Predavanja / Lectures:	SLOVENSKO/SLOVENE
	Vaje / Tutorial:	SLOVENSKO/SLOVENE

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Prerequisits:

Vsebina:

Vsebina predmeta se prilagaja aktualnim potrebam in razvoju. Poglobili bomo znanje iz uporabe računalnika pri reševanju matematičnih problemov, predvsem s področja diskretne matematike.

- Relacije in algoritmi nad relacijami

- Boolova algebra

- Prirejanja v grafih

Content (Syllabus outline):

The contents of this subject is adjusted to the current needs and development. We will deepen the knowledge of using a computer to solve mathematical problems, mainly from discrete mathematics.

- relations and algorithms on relations

- Bool algebra

- matchings in graphs

Temeljni literatura in viri / Readings:

B. Vilfan, Osnovni algoritmi, ISBN 961-6209-13-2, Založba FER in FRI, 2. izd., 2002.

Kenneth H. Rosen, Discrete Mathematics and Its Applications, ISBN 007-2880-08-2, McGraw-Hill, 6th ed., 2007.

Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Introduction to Algorithms, ISBN 026-2032-93-7, The MIT Press, 2nd ed., 2001.

Cilji in kompetence:	**Objectives and competences:**
Z uporabo modernega, predmetno usmerjenega programskega jezika, poglobiti znanje iz pristopov, podatkovnih struktur in algoritmov pri reševanju matematičnih problemov.	With the usage of modern object oriented programming language, to deepen the knowledge of the basic approaches, data structures and algorithms for solving mathematical problems.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: • podatkovne strukture matematičnih modelov • razumevanje, implementacija in uporaba pomembnejših algoritmov Prenesljive/ključne spretnosti in drugi atributi: • uporaba matematičnih pojmov v programskih aplikacijah • uporaba ustreznih podatkovnih struktur pri implementaciji matematičnih algoritmov • pridobljena znanja se prenašajo na druge z računalništvom povezane predmete	Knowledge and Understanding: • data structures of mathematical models • understanding, implementation and usage of important algorithms Transferable/Key Skills and other attributes: • the usage of mathematical notions in applications • the usage of appropriate data structures while implementing mathematical algorithms • the obtained knowledge is transferable to the other computer science oriented subjects

Metode poučevanja in učenja:	**Learning and teaching methods:**
• Predavanja, seminar • Računalniške vaje	• Lectures, seminary • Computer exercises

Načini ocenjevanja: **Assessment:**

	Delež (v %) / Weight (in %)	
Sprotno preverjanje:		Mid-term testing:
Seminarska naloga	20%	Seminary work
Projekt	20%	Project
Pisni testi – teorija (3 do 5 pisnih testov na semester)	40%	Written tests – theory (from 3 to 5 written tests during the semester)

Izpit: Pisni izpit – problemi	20%	Exams: Written exam - problems
Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno. Opravljene sprotne obveznosti so pogoj za pristop k izpitu.		Each of the mentioned commitments must be assessed with a passing grade. Passing grades of all mid-term testings are required for taking the exam.
Reference nosilca / Lecturer's references:		

1. BREŠAR, Boštjan, JAKOVAC, Marko, KATRENIČ, Ján, SEMANIŠIN, Gabriel, TARANENKO, Andrej. On the vertex k-path cover. *Discrete appl. math.*. [Print ed.], 2013, vol. 161, iss. 13/14, str. 1943-1949, doi: 10.1016/j.dam.2013.02.024. [COBISS.SI-ID19859464]

2. JAKOVAC, Marko, TARANENKO, Andrej. On the k-path vertex cover of some graph products. *Discrete math.*. [Print ed.], 2013, vol. 313, iss. 1, str. 94-100. http://dx.doi.org/10.1016/j.disc.2012.09.010, doi: 10.1016/j.disc.2012.09.010. [COBISS.SI-ID19464968]

3. TARANENKO, Andrej, VESEL, Aleksander. 1-factors and characterization of reducible faces of plane elementary bipartite graphs. *Discuss. Math., Graph Theory*, 2012, vol. 32, no. 2, str. 289-297, doi: 10.7151/dmgt.1607. [COBISS.SI-ID 19104264]

4. TARANENKO, Andrej, ŽIGERT PLETERŠEK, Petra. Resonant sets of benzenoid graphs and hypercubes of their resonance graphs. *MATCH Commun. Math. Comput. Chem. (Krag.)*, 2012, vol. 68, no. 1, str. 65-77.http://www.pmf.kg.ac.rs/match/content68n1.htm. [COBISS.SI-ID 16051990]

5. KLAVŽAR, Sandi, SALEM, Khaled, TARANENKO, Andrej. Maximum cardinality resonant sets and maximal alternating sets of hexagonal systems. *Comput. math. appl. (1987)*. [Print ed.], 2010, vol. 59, no. 1, str. 506-513.http://dx.doi.org/10.1016/j.camwa.2009.06.011. [COBISS.SI-ID 15383641]