UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Osnove programiranja v diskretni matematiki
Course title:	Basic programming in discrete mathematics

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Enovit magistrski študijski program druge stopnje Predmetni učitelj	/	5.	9.
Five-year master's degree program Subject Teacher	/		

Vrsta predmeta / Course type — Izbirni / Elective

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Terenske vaje Field work	Samost. delo Individ. work	ECTS
15	15		30		150	7

Nosilec predmeta / Lecturer: Aleksander Vesel

Jeziki / Languages:	Predavanja / Lectures:	slovenski / slovene
	Vaje / Tutorial:	slovenski / slovene

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

Prerequisits:

Vsebina:

Content (Syllabus outline):

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	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 • Računalniške in teoretične vaje	• Lectures • Computer and theoretical exercises

Načini ocenjevanja: **Assessment:**

Sprotno preverjanje:		Mid-term testing:
Projekt	20%	Project
Seminar	20%	Seminary work
Pisni testi – teorija (2 pisna testa)	40%	Written tests – theory (2 written tests)
Izpit:		Exams:
Pisni izpit – problem	20%	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:

A. Vesel, Linear recognition and embedding of Fibonacci cubes. *Algorithmica*, 2013, str. 1-14.

A. Vesel, Fibonacci dimension of the resonance graphs of catacondensed benzenoid graphs. *Discrete appl. math.*, 2013, vol. 161, issue 13-14, str. 2158-2168.

Z. Shao, A. Vesel, Integer linear programming model and satisfiability test reduction for distance constrained labellings of graphs: the case of L(3,2,1) labelling for products of paths and cycles. *IET communications*, 2013, vol. 7, iss. 8, str. 715-720.

D. Korže, A. Vesel, A note on the independence number of strong products of odd cycles. *Ars comb.*, 2012, vol. 106, str. 473-481.

A. Vesel, 4-tilings of benzenoid graphs. *MATCH Commun. Math. Comput. Chem. (Krag.)*, 2009, vol. 62, str. 221-234.