Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Računalniški praktikum
Course title:	Programming practicum

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Izobraževalna matematika – dvopredmetni, 1. stopnja		2. ali 3.	4. ali 6.
Educational mathematics – Double-major, 1st degree		2. or 3.	4. or 6.

Vrsta predmeta / Course type	Izbirni / Elective

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
15			15		150	6

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:
Jih ni.	There are none.

Vsebina:	Content (Syllabus outline):
Sistemska programska oprema: operacijski sistem (zgradba OS, vrste in primeri OS), prevajalnik, povezovalnik, nalagalnik, testni program. Programsko okolje: priprava programa, prevajanje, testiranje in izvajanje. Značilnosti sodobnih programskih jezikov. Osnove objektnega programiranja (objekti, metode, razredi, enkapsulacija, dedovanje, polimorfizem). Modeli matematičnih objektov predstavljeni v izbranem programskem jeziku.	System software: operating system (functions of OS, structure of OS, varieties of OS, examples of common OS), compiler, linker, loader, debbuger. Programming environment: program coding, compiling, testing and executing. Characteristics of the state-of-the-art programming languages. Principles of object-oriented programming (objects, methods, classes, encapsulation, inheritance, polymorphism). Models of mathematical objects presented in the the chosen programming language.

Temeljni literatura in viri / Readings:

Deloma odvisni od izbranega programskega jezika: npr. D. Marshall, Programming Microsoft Visual C# 2005 : The language, Microsoft Press, 2006.

J. G. Brookshear, Computer science: an overview, Addison-Wesley, 2005.

K. B. Bruce, Foundations of object-oriented languages, MIT Press, 2002.

M. Mernik, V. Žumer, Programski jeziki, Fakulteta za elektrotehniko,računalništvo in informatiko, 2003.

Cilji in kompetence:	Objectives and competences:
Spoznati zahtevnejše računalniške koncepte: operacijski sistem in druge vrste sistemske programske opreme, računalniška omrežja in sodobne programske jezike.	Know more demanding concepts from computer science: operation system and the other system software programs, computer networks and state-of-the-art programming languages.

Predvideni študijski rezultati: / Intended learning outcomes:

Znanje in razumevanje:	Knowledge and Understanding:
• Razumevanje zahtevnejših principov računalništva. • Spoznati vrste sistemske programske opreme. • Sposobnost pisanja kompleksnih programov. Prenesljive/ključne spretnosti in drugi atributi: • Prenos znanja računalništva na druga področja (matematika, biologija, kemija, optimizacija, …).	• Be able to understand more demanding principals of computer science. • To know a variety of system software programs. • Be able to write a complex computer program. Transferable/Key Skills and other attributes: • Knowledge transfer of methods of computer science into other fields (mathematics, chemistry, biology, optimization, …).

Metode poučevanja in učenja: / Learning and teaching methods:

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

Načini ocenjevanja: / Assessment:

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Sprotno preverjanje:		Mid-term testing:
Pisni testi – teorija (3 do 5 pisnih testov na semester)	30%	Written tests – theory (from 3 to 5 written tests during the semester)
Naloge	20%	Coursework
Izpit:		Exams:
Pisni izpit – problemi	50%	Written exam - problems
Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.		Each of the mentioned commitments must be assessed with a passing grade.
Opravljene sprotne obveznosti so pogoj za pristop k izpitu.		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 Applied Mathematics*, ISSN 0166-218X. [Print ed.], 2013, vol. 161, iss. 13/14, str. 1943-1949. http://dx.doi.org/10.1016/j.dam.2013.02.024. [COBISS.SI-ID 19859464]

2. TARANENKO, Andrej. A new characterization and a recognition algorithm of Lucas cubes. *Discrete mathematics and theoretical computer science*, ISSN 1365-8050, 2013, vol. 15, no. 3, str. 31-39. http://www.dmtcs.org/dmtcs-ojs/index.php/dmtcs/article/view/2192/4357. [COBISS.SI-ID 20090376]

3. JAKOVAC, Marko, TARANENKO, Andrej. On the k-path vertex cover of some graph products. *Discrete Mathematics*, ISSN 0012-365X. [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-ID 19464968]

4. TARANENKO, Andrej, VESEL, Aleksander. 1-factors and characterization of reducible faces of plane elementary bipartite graphs. *Discussiones mathematicae, Graph theory*, ISSN 1234-3099, 2012, vol. 32, no. 2, str. 289-297, doi: 10.7151/dmgt.1607. [COBISS.SI-ID 19104264]

5. TARANENKO, Andrej, ŽIGERT PLETERŠEK, Petra. Resonant sets of benzenoid graphs and hypercubes of their resonance graphs. *MATCH Communications in Mathematical and in Computer Chemistry*, ISSN 0340-6253, 2012, vol. 68, no. 1, str. 65-77. http://www.pmf.kg.ac.rs/match/content68n1.htm. [COBISS.SI-ID 16051990]