



Univerza v Mariboru



Univerza v Mariboru

Fakulteta za naravoslovje in
matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Osnove računalništva in informatike
Course title:	Fundamentals of Computer Science and Informatics

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Matematika	Splošna matematika	1.	1.
Mathematics	General Mathematics	1.	1.

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			45		120	7

Nosilec predmeta / Lecturer:

Aleksander VESEL

Jeziki /

Languages:

Predavanja /

Lectures:

Vaje / Tutorial:

SLOVENSKO/SLOVENE

SLOVENSKO/SLOVENE

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

Jih ni.

Prerequisites:

There are none.

Vsebina:

Zgradba osebnega računalnika: centralna procesna enota, pomnilniške enote, vhodno izhodne enote.

Predstavitev informacije v računalniku: dvojiški zapis, količina informacije, predstavitev števil, znakov in grafike.

Programski jeziki: strojni, zbirni, višji programski jeziki, programski jeziki 4. generacije, primeri.

Content (Syllabus outline):

Computer hardware: central processing unit, RAM and secondary storage, input and output devices.

Representation of information: binary sistem, representation of numbers, characters and graphics.

Programming languages: machine languages, assembly languages, high-level languages, fourth generation languages.

Struktura programa, spremenljivke in konstante, branje in izpis, aritmetični in logični izrazi ter prireditveni stavek. Krmilni stavki: zaporedje, vejitve in zanke. Podatkovni tipi: osnovni, sestavljeni, proceduralni. Podprogrami in rekurzivni podprogrami. Datoteke: vrste datotek, delo z datotekami.	Program structure, variables and constants, read and write procedures, arithmetic and logic expressions, assignment statement. Structured statements: compound, conditional and loop statements. Data types: simple, structural, procedural. Procedures and recursive procedures. Files: file types, working with files.
---	---

Temeljni literatura in viri / Readings:

Deloma odvisni od izbranega programskega jezika: npr. D. Capper, <i>Introducing C++ for Scientists, Engineers and Mathematicians</i>, Springer, 2001. R. A. Szymanski et al., <i>Introduction to computers and software</i>, Prentice-Hall, 1996. J. G. Brookshear, <i>Computer science: an overview</i>, Addison-Wesley, 2005. D. Hankerson, <i>Introduction to Information Theory and Data Compression</i>, Chapman & Hall/CRC, 2003.

Cilji in kompetence:

Spoznati temeljne koncepte računalništva in informatike (zgradba računalnika, predstavitev informacije v računalniku, vrste programskih jezikov) ter osnove višjega programskega jezika.

Objectives and competences:

Know fundamental concepts from computer science (computer hardware, representation of information, programming languages) and the fundamental principles of a high-level programming language.

Predvideni študijski rezultati:

Znanje in razumevanje: • Poznavanje zgradbe računalnika. • Spoznati različne generacije programskih jezikov. • Spoznati osnove izbranega programskega jezika. • Sposobnost pisanja srednje zahtevnih programov. Prenesljive/ključne spretnosti in drugi atributi: • Prenos znanja računalništva na druga področja (matematika, biologija, kemija, optimizacija, ...)

Intended learning outcomes:

Knowledge and Understanding: • To know the computer hardware. • To know a variety of programming languages. • To know the fundamental principles of a high-level programming language. • Be able to write a moderately 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:	
• Predavanja • Računalniške vaje		• Lectures • Computer exercises	
Načini ocenjevanja:		Assessment:	
Način (pisni izpit, ustno izpraševanje, naloge, projekt) Pisni test – problemi Izpit (pisni) - teorija Naloge Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno. Pozitivni oceni pri pisnem testu in nalogah sta pogoj za pristop k izpitu.	Delež (v %) / Weight (in %) 40% 40% 20%	Type (examination, oral, coursework, project): Written test - problems Exam (written) – theory Coursework Each of the mentioned commitments must be assessed with a passing grade. Passing grades of the written test and coursework are required for taking the exam.	
Reference nosilca / Lecturer's references:			
1. KORŽE, Danilo, VESEL, Aleksander. A note on the independence number of strong products of odd cycles. <i>Ars comb.</i>, 2012, vol. 106, str. 473-481. [COBISS.SI-ID 16138006] 2. TARANENKO, Andrej, VESEL, Aleksander. 1-factors and characterization of reducible faces of plane elementary bipartite graphs. <i>Discuss. Math., Graph Theory</i>, 2012, vol. 32, no. 2, str. 289-297, doi: 10.7151/dmgt.1607. [COBISS.SI-ID 19104264] 3. SALEM, Khaled, KLAVŽAR, Sandi, VESEL, Aleksander, ŽIGERT, Petra. The Clar formulas of a benzenoid system and the resonance graph. <i>Discrete appl. math.</i>. [Print ed.], 2009, vol. 157, iss. 11, str. 2565-2569. http://dx.doi.org/10.1016/j.dam.2009.02.016. [COBISS.SI-ID 15142489] 4. VESEL, Aleksander. 4-tilings of benzenoid graphs. <i>MATCH Commun. Math. Comput. Chem. (Krag.)</i>, 2009, vol. 62, no. 1, str. 221-234. [COBISS.SI-ID 16886536] 5. TARANENKO, Andrej, VESEL, Aleksander. Characterization of reducible hexagons and fast decomposition of elementary benzenoid graphs. <i>Discrete appl. math.</i>. [Print ed.], 2008, vol. 156, iss. 10, str. 1711-1724. http://dx.doi.org/10.1016/j.dam.2007.08.029, doi: 10.1016/j.dam.2007.08.029. [COBISS.SI-ID 16140552]			