



Univerza v Mariboru



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Fakulteta za naravoslovje in
matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Osnove informacijske tehnologije
Course title:	Basic of information technology

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Matematika, 2. stopnja		1. ali 2.	1. ali 3.
Mathematics, 2 nd degree		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			30		135	7

Nosilec predmeta / Lecturer:

Krista RIZMAN ŽALIK

Jeziki /

Languages:

Predavanja /

Lectures:

SLOVENSKO/SLOVENE

Vaje / Tutorial:

SLOVENSKO/SLOVENE

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

Prerequisites:

Vsebina:

Informacijska teorija.
Merilo informacije,
enačba informacije,
entropija informacije.
Algoritmična informacijska teorija.
Uporaba informacijske teorije v strojnem
učenju: Bayesovo učenje, lučenje odločitvenih
dreves.
Uveljavljene in novejšie metode in orodja
razvoja informacijskih sistemov in programske
opreme.

Content (Syllabus outline):

Information theory.
Data and information.
Measure of information equation,
entropy of information.
Algorithmic information theory.
The use of information theory in machine
learning:
Bayesian inference, learning decision trees.
Enforced and new methods and tools for
software development of information systems
development.

Arhitekture informacijskih sistemov: podatkovno usmerjena, pretočna arhitektura, arhitektura z virtualnim strojem, arhitektura klica in vrnitve, aktualne komponente arhitekture.
Arhitektura aplikacij za svetovni splet in distribuirani objektni sistemi.
Vzporedno programiranje in koncepti vzporednost, večnitnost, sinhronizacija.
Načrtovalni vzorci.

Architectures: data cantered, dataflow architecture, virtual machine architecture, call and return architecture, actual component architecture.
Architecture of internet applications and distributed object systems.
Concurrent programming and concept concurrency, parallelism, multithreading, synchronization.
Design patterns.

Temeljni literatura in viri / Readings:

U. Mesojedec, Java, programiranje za internet, Pasadena, 1997.
M. Campione, K. Walrath, The Java tutorial : object-oriented programming for the Internet, Addison-Wesley, 1996.
Stevens, P., Pooley, R., Using UML: software engineering with objects and components, Addison-Wesley, 2000.
Erich Gamma, Design Patterns: Elements of Reusable Object-Oriented Software (Addison-Wesley, 1995.
Eric Reiss, Practical Information Architecture. Harlow, UK: Pearson Education, 2000.

Cilji in kompetence:

Poglobiti znanje iz pojmov informacij in elementov teorije informacij in obdelave informacij.

Objectives and competences:

The main objective is to deepen the knowledge about information, elements of information theory and information management.

Predvideni študijski rezultati:

Znanje in razumevanje:
Znanje temeljnih teoretičnih konceptov informacij, obdelav informacij in teorije informacij in obdelave informacij ter različnih arhitektur.

Intended learning outcomes:

Knowledge and Understanding:
The knowledge of basic theoretical foundations of information, manipulation of information and information theory and different architectures.

Metode poučevanja in učenja:

Predavanja
Računalniške vaje

Learning and teaching methods:

Lectures
Computer exercises

Načini ocenjevanja:

Način (pisni izpit, ustno izpraševanje, naloge, projekt)
- Računalniške vaje
- Pisni izpit

- Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.

- Pozitivna ocena pri vajah je pogoj za pristop k izpitu.

Delež (v %) /
Weight (in %)
50%
50%

Assessment:

Type (examination, oral, coursework, project):
- Computer exercises
- Written exam

- Each of the mentioned commitments must be assessed with a passing grade.

- Passing grade of the exercises is required for taking the exam.

Reference nosilca / Lecturer's references:		
1. RIZMAN ŽALIK, Krista, ŽALIK, Borut. Validity index for clusters of different sizes and densities. <i>Pattern recogn. lett. (Print)</i>. [Print ed.], Jan. 2011, vol. 32, iss. 2, str. 221-234, doi: 10.1016/j.patrec.2010.08.007. [COBISS.SI-ID 14640150] 2. RIZMAN ŽALIK, Krista. Cluster validity index for estimation of fuzzy clusters of different sizes and densities. <i>Pattern recogn.</i>. [Print ed.], Oct. 2010, vol. 43, iss. 10, str. 3374-3390, doi: 10.1016/j.patcog.2010.04.025. [COBISS.SI-ID 14640406] 3. RIZMAN ŽALIK, Krista, ŽALIK, Borut. A sweep-line algorithm for spatial clustering. <i>Adv. eng. softw. (1992)</i>. [Print ed.], Jun. 2009, vol. 40, iss. 6, str. 445-451, doi: 10.1016/j.advengsoft.2008.06.003. [COBISS.SI-ID 12450582] 4. RIZMAN ŽALIK, Krista. An efficient k'-means clustering algorithm. <i>Pattern recogn. lett. (Print)</i>. [Print ed.], July 2008, vol. 29, iss. 9, str. 1385-1391. http://dx.doi.org/10.1016/j.patrec.2008.02.014. [COBISS.SI-ID 12121366] 5. RIZMAN ŽALIK, Krista. Discovering significant biclusters in gene expression data. <i>WSEAS transactions on information science and applications</i>, Sep. 2005, vol. 2, iss. 9, str. 1454-1461. [COBISS.SI-ID 14906120]		