



Univerza v Mariboru



Univerza v Mariboru

Fakulteta za naravoslovje in  
matematiko

## UČNI NAČRT PREDMETA / COURSE SYLLABUS

|                      |                               |
|----------------------|-------------------------------|
| <b>Predmet:</b>      | <b>Osnove podatkovnih baz</b> |
| <b>Course title:</b> | Bases of Databases            |

| Študijski program in stopnja<br>Study programme and level              | Študijska smer<br>Study field | Letnik<br>Academic year | Semester<br>Semester |
|------------------------------------------------------------------------|-------------------------------|-------------------------|----------------------|
| Izobraževalno računalništvo –<br>dvopredmetni, 1. stopnja              |                               | 2.                      | 4.                   |
| Educational computer science –<br>Double-major, 1 <sup>st</sup> degree |                               | 2.                      | 4.                   |

Vrsta predmeta / Course type

Univerzitetna koda predmeta / University course code:

| Predavanja<br>Lectures | Seminar<br>Seminar | Sem. vaje<br>Tutorial | Lab. vaje<br>Laboratory work | Teren. vaje<br>Field work | Samost. delo<br>Individ. work | ECTS |
|------------------------|--------------------|-----------------------|------------------------------|---------------------------|-------------------------------|------|
| 30                     | 15                 |                       | 15                           |                           | 60                            | 4    |

Nosilec predmeta / Lecturer:

Krista RIZMAN ŽALIK

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:

Osnovni koncepti:  
definicije podatkovne baze,  
vrste podatkovnih baz,  
baza kot model realnosti- entitete, razmerja,  
atributi,

Content (Syllabus outline):

Basic concepts:  
definitions of databases,  
types of databases,  
database as model of reality- entities,relations,  
attributes,

trinivojska arhitektura podatkovne baze, sistemi za upravljanje podatkovnih baz.

Relacijske podatkovne baze: relacijski podatkovni model, SQL.  
Nivoji abstrakcije in podatkovna neodvisnost.  
Elementi logičnega in fizičnega podatkovnega modela: indeksi, omejitve integritete, pogledi, transakcije, prožilci.

Sistemi za upravljanje z bazami podatkov: Izvajanje povpraševanj. Varovanje v podatkovnih bazah. Podatkovne nesreče in obnavljanje. Upravljanje transakcij. Kontrola vzporednosti. Optimizacija povpraševanj.

three tier database architecture, database management systems.

Relational databases: the relational data model;SQL.  
Data abstraction levels and independence.  
Elements of logical and physical data model: indexes, integrity constraints, views, transactions, triggers.

Database management systems: Query processing. Database security. Data crash and recovery. Transaction management. Concurrency control. Query optimization.

### Temeljni literatura in viri / Readings:

Tomaž Mohorič, Podatkovne baze, Založba Bi-TIM, 2002.

M., L., Gillerson, Fundamentals of database management systems, Wiley & Sons, 2005.

Ramakrishna R. , Gehrke J., Database management systems, McGraw-Hill, 2003.

### Cilji in kompetence:

Predmet podaja temeljna znanja o zasnovi in delovanju sistemov za upravljanje s podatki in o izdelavi in uporabi podatkovne baze omejene kompleksnosti.

### Objectives and competences:

This course gives basic knowledge about the contents and working of database management systems and about the use of database of limited complexity.

### Predvideni študijski rezultati:

Znanje in razumevanje:  
Razumevanje delovanja sistemov podatkovnih baz.

Znanje izdelati podatkovno bazo in izdelati povpraševanja s programskim jezikom SQL.

Prenesljive/ključne spretnosti in drugi atributi:  
Reševanje problemov: načrtovanje in implementacija preprostih podatkovnih baz.

### Intended learning outcomes:

Knowledge and Understanding:  
Understand how database management systems work.

Database creation and querying with programming language SQL.

Transferable/Key skills and other attributes:  
Problem solving: designing and implementing simple databases.

### Metode poučevanja in učenja:

- Predavanja

### Learning and teaching methods:

- Lectures

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                         |                                                                                                                                                                                                                                                                                               |
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| <ul style="list-style-type: none"> <li>• Računalniške vaje</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                         | <ul style="list-style-type: none"> <li>• Computer exercises</li> </ul>                                                                                                                                                                                                                        |
| <b>Načini ocenjevanja:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                         | <b>Assessment:</b>                                                                                                                                                                                                                                                                            |
| Način (pisni izpit, ustno izpraševanje, naloge, projekt)<br>Vaje<br>Seminar<br>Izpit (ustni) – teoretični del<br><br>Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.<br><br>Pozitivna ocena pri vajah in seminarju je pogoj za pristop k izpitu.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Delež (v %) /<br>Weight (in %)<br><br>30%<br>30%<br>40% | Type (examination, oral, coursework, project):<br>Computer exercises<br>Seminar<br>Exam (oral) – theoretical part<br><br>Each of the mentioned commitments must be assessed with a passing grade.<br><br>Passing grade of the computer exercises and seminar is required for taking the exam. |
| <b>Reference nosilca / Lecturer's references:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                         |                                                                                                                                                                                                                                                                                               |
| <ol style="list-style-type: none"> <li>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: <a href="https://doi.org/10.1016/j.patrec.2010.08.007">10.1016/j.patrec.2010.08.007</a>. [COBISS.SI-ID <a href="https://cobiss.si/14640150">14640150</a>]</li> <li>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: <a href="https://doi.org/10.1016/j.patcog.2010.04.025">10.1016/j.patcog.2010.04.025</a>. [COBISS.SI-ID <a href="https://cobiss.si/14640406">14640406</a>]</li> <li>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: <a href="https://doi.org/10.1016/j.advengsoft.2008.06.003">10.1016/j.advengsoft.2008.06.003</a>. [COBISS.SI-ID <a href="https://cobiss.si/12450582">12450582</a>]</li> <li>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. <a href="http://dx.doi.org/10.1016/j.patrec.2008.02.014">http://dx.doi.org/10.1016/j.patrec.2008.02.014</a>. [COBISS.SI-ID <a href="https://cobiss.si/12121366">12121366</a>]</li> <li>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 <a href="https://cobiss.si/14906120">14906120</a>]</li> </ol> |                                                         |                                                                                                                                                                                                                                                                                               |