



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Osnove podatkovnih baz
Course title:	Fundamentals of Databases

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	/	2	zimski
Five-year master's degree program Subject Teacher	/	2	winter

Vrsta predmeta / Course type

Obvezni/ Obligatory

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
30	15		15		90	5

Nosilec predmeta / Lecturer:

Krista Rizman Žalik

Jeziki /

Languages:

Predavanja /

Lectures:

slovenski/slovenian

Vaje / Tutorial:

slovenski/slovenian

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

Vsaka izmed naštetih obveznosti v načinih ocenjevanja mora biti opravljena s pozitivno oceno.

Pozitivne ocene pri sprotnih nalogah in seminarski nalogi so pogoj za pristop k izpitu./

Prerequisites:

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

Passing grades for coursework and seminar paper are required for taking the exam./

Vsebina:

Content (Syllabus outline):

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

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

T. Mohorič, Uvod v podatkovne baze, Založba Bi-TIM, 2002.

Dodatna literatura:

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

Seven Databases in Seven Weeks: A Guide to Modern Databases and the NoSQL

Movement, 2nd edition, Pragmatic Bookshelf, 2018

Cilji in kompetence:

Cilj predmeta je, da študenti razumejo delovanje sistemov za upravljanje s podatkovnimi bazami in znajo zgraditi in uporabiti podatkovno bazo omejene kompleksnosti.

Objectives and competences:

The objective of this course is for students to be able to demonstrate the understanding of operation of database management systems and to create database of limited complexity.

Predvideni študijski rezultati:

Znanje in razumevanje:

Po zaključku tega predmeta bo študent sposoben:

- razložiti delovanja sistemov podatkovnih baz,
- načrtovati in izdelati podatkovne baze in povpraševanja s programskim jezikom SQL.

Prenesljive/ključne spretnosti in drugi atributi:

- Spretnosti komuniciranja: pisanje strokovnega poročila, ustno izražanje pri izpitu.
- Uporaba informacijske tehnologije: uporaba programskih jezikov in tehnologije svetovnega spleta.
- Reševanje problemov: načrtovanje in implementacija podatkovnih baz e omejene kompleksnosti.

Intended learning outcomes:

Knowledge and Understanding:

On the completion of this course the student will be able to:

- explain how database management systems work,
- create databases and queries with programming language SQL.

Transferable/Key skills and other attributes:

- Communication skills: preparation of a report, al communication at an examination.
- Use of information technology: the use of programming languages and internet technology.
- Problem solving: creating databases of limited complexity.

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Metode poučevanja in učenja:

Predavanja
Seminar
Računalniške vaje

Learning and teaching methods:

Lectures
Seminar
Computer exercises

Načini ocenjevanja:

sprotne naloge projekt
pisni izpit
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Delež (v %) /

Weight (in %)

Assessment:

coursework project
written exam

Opombe:

Pisni izpit se lahko nadomesti s kolokviji v enakem deležu 40%.

Comments:

Written exam can be replaced by written midterm examination in the weight of 40%.

Reference nosilca / Lecturer's references:

1. RIZMAN ŽALIK, Krista, ŽALIK, Mitja. Density-based entropy centrality for community detection in complex networks. *Entropy*. 2023, vol. 25, iss. 8, [art. no.] 1196, 17 str., ilustr. ISSN 1099-4300.
2. RIZMAN ŽALIK, Krista, ŽALIK, Mitja. A review of federated learning in agriculture. *Sensors*. 2023, vol. 23, iss. 23, [article no.] 9566, 20 str. ISSN 1424-8220.
3. NERAT, Andrej, STRNAD, Damjan, RIZMAN ŽALIK, Krista, ŽALIK, Borut. An efficient multi-resolution chain coding. *IEEE access*. Date of Publication: 15 April 2024, 11 str., ilustr. ISSN 2169-3536.
4. CUKJATI, Jernej, MONGUS, Domen, RIZMAN ŽALIK, Krista, ŽALIK, Borut. IoT and satellite sensor data integration for assessment of environmental variables: a case study on NO2. *Sensors*. 2022, vol. 22, iss. 15, 16 str. ISSN 1424-8220. DOI: 10.3390/s22155660
5. REPNIK, Blaž, ŽALIK, Borut, RIZMAN ŽALIK, Krista. Compression of triangulated solids' surfaces by Decimating Reconstructable Triangles. *SoftwareX*. May 2025, vol. 30, [article no.] 102179.