UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Uvod v podatkovne baze
Course title:	Introduction to Databases

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Enovit magistrski študijski program Predmetni učitelj 2. stopnje	**Izobraževalna tehnika**	**3**	**6**
Five-year master's degree program Subject teacher	**Technical education**	**3**	**6**

Vrsta predmeta / Course type Izbirni / elective

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
21		**24**			**45**	**3**

Nosilec predmeta / Lecturer: Aida Kamišalić Latifić

Jeziki / Languages:	Predavanja / Lectures:	slovenski / slovene
	Vaje / Tutorial:	slovenski / slovene

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

Prerequisits:

Pogojev ni.

None.

Vsebina:

Content (Syllabus outline):

• Osnove relacijskih podatkovnih baz, opredelitev lastnosti ACID.	• Fundamentals of relational databases, Definition of ACID properties.
• Osnove podatkovnih shramb NoSQL, opredelitev lastnosti BASE.	• Fundamentals of NoSQL data stores, Definition of BASE properties.
• Uvod v oblikovanje podatkovne baze: seznanitev z osnovnimi pojmi in s posameznimi fazami oblikovanja.	• Introduction to database design: basic concepts and the various design phases.
• Konceptualno modeliranje: vloga konceptualnega modela, uvedba entitetno - relacijskega (E-R) modela.	• Conceptual modelling: the role of the conceptual model, introduction to the Entity-Relationship model.
• Normalizacija: vloga in pomen normalizacije pri oblikovanju podatkovne baze.	• Normalization: the role and importance of normalization in database design.
• Logično modeliranje: predstavitev logičnega modeliranja in logičnega (relacijskega) podatkovnega modela.	• Logical modelling: presentation of logical modelling and the logical (relational) data model.
• Povpraševalni jezik: SQL - osnovni in sestavljeni stavki, primeri uporabe.	• Query language: SQL – basic and complex statements, use cases.

Temeljni literatura in viri / Readings:

- DT. Mohorič: Podatkovne baze, Bi-TIM, Ljubljana, 2002.
- B. Brumen: SQL osnove strukturiranega poizvedovalnega jezika, DZS, 2013.
- T. Connolly, C. Begg: Database Systems: A Practical Approach to Design, Implementation and Management, 6th. Edition, Pearson, 2015.
- G. Harrison: Next Generation Databases: NoSQL, NewSQL and Big Data, Apress, 2015.
- R. Elmasri, S. Navathe: Fundamentals of Database Systems, 7th.Edition, Pearson, 2017.
- C. Coronel, S. Morris: Database Systems – Design, implementation, & management, 13th Edition, Cengage, 2017.
- R.T. Watson: Data Management: Databases and Organization, 6th Edition, Prospect Press, 2018.
- C. J. Date: Database Design and Relational Theory: Normal Forms and All That Jazz, 2nd Edition, Apress, 2019.

Cilji in kompetence:	**Objectives and competences:**
Cilj predmeta je usposobiti študente, da bodo razumeli princip delovanja relacijskih podatkovnih baz in podatkovnih shramb NoSQL, poznali ANSI-SPARC arhitekturo in da bodo razumeli razliko med posameznimi fazami modeliranja relacijske podatkovne baze. Ključni cilj je študente pripraviti, da bodo znali načrtovati relacijsko podatkovno bazo, učinkovito uporabiti povpraševalni jezik SQL za upravljanje tabel relacijske podatkovne baze, ter vnašanje, posodabljanje, brisanje in branje podatkov iz relacijske podatkovne baze.	The objective of the course is to prepare students to understand the principles of relational databases and NoSQL data stores, be familiar with the ANSI-SPARC architecture and to prepare them to understand the difference between the individual different phases of the relational database modelling. The key goal is to prepare students to be able to design a relational database properly, and effectively use the SQL query language to manage the relational database tables, and to insert, update, delete and retrieve data from the relational database.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Po zaključku tega predmeta bo študent sposoben: • razumeti osnovne koncepte relacijskih podatkovnih baz v povezavi z lastnostmi ACID, • razumeti osnovne koncepte podatkovnih shramb NoSQL v povezavi z lastnostmi BASE, • opisati ANSI-SPARC arhitekturo, • razumeti konceptualno, logično in fizično modeliranje relacijske podatkovne baze, • načrtovati preproste relacijske podatkovne baze, • izvesti konceptualno modeliranje relacijske podatkovne baze s pomočjo E-R diagramske tehnike, • pretvoriti konceptualni model v logični (relacijski) podatkovni model, • uporabiti povpraševalni jezik SQL za upravljanje tabel relacijske podatkovne baze, za izvedbo vnašanja, posodabljanja, brisanja in pridobivanja podatkov iz relacijske podatkovne baze. Prenosljive/ključne spretnosti in drugi atributi: • Spretnosti komuniciranja ustni zagovor računalniških vaj, izražanje pri pisnem izpitu. • Uporaba informacijske tehnologije: uporaba programskih orodij za načrtovanje podatkovnih baz, pripravo relacijskega podatkovnega modela in izvedbo povpraševanja. • Reševanje problemov: načrtovanje in implementacija preprostih podatkovnih baz.	Knowledge and understanding: Upon completion of this course, the student will be able to: • understand the basic concepts of relational databases considering ACID properties • understand the basic concepts of NoSQL data stores considering BASE properties • describe the ANSI-SPARC architecture, • understand the conceptual, logical, and physical database modelling, • design simple relational database, • perform conceptual modelling of a relational database using the E-R diagram technique, • transform the conceptual model into a logical (relational) data model, • use the SQL query language to manage relational database tables, to execute inserting, updating, deleting, and retrieving data from the relational database. Transferable/Key skills and other attributes: • Communication skills: oral defense of computer excercises, manner of expression at the written examination. • Use of information technology: use of software tools for database design, preparation of relational data model, and query statements execution. • Problem-solving: design and implementation of simple databases.

Metode poučevanja in učenja:

- Predavanja,
- računalniške vaje.

Learning and teaching methods:

- Lectures,
- Computer excercises.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Način (pisni izpit, ustno izpraševanje, naloge, projekt): • Laboratorijsko delo, • pisni izpit.	 40 60	Type (examination, oral, coursework, project): • Laboratory work, • Written exam.

Reference nosilca / Lecturer's references:

- KAMIŠALIĆ, Aida, RIAÑO, David, KERT, Suzana, WELZER-DRUŽOVEC, Tatjana, NEMEC ZLATOLAS, Lili. Multi-level medical knowledge formalization to support medical practice for chronic diseases. Data & Knowledge Engineering. [Print ed.]. Jan. 2019, vol. 219, str. 36-57. ISSN 0169-023X. DOI: 10.1016/j.datak.2018.12.001. [COBISS.SI-ID 21986582]
- KAMIŠALIĆ, Aida, TURKANOVIĆ, Muhamed, WELZER-DRUŽOVEC, Tatjana, HERIČKO, Marjan. Teaching the fundamental concepts of relational databases to students with different educational background - an experimental study. V: DAHANAYAKE, Ajantha (ur.), et al. Information modelling and knowledge bases XXXI. Amsterdam [etc.]: IOS Press, cop. 2020. Str. 48-58. Frontiers in artificial intelligence and applications, Vol. 321. ISBN 978-1-64368-044-6, ISBN 978-1-64368-045-3. ISSN 0922-6389. DOI: 10.3233/FAIA200005. [COBISS.SI-ID 22966294]
- KAMIŠALIĆ LATIFIĆ, Aida, KOVAČEVIĆ, Renata, FISTER, Iztok. Synergy of blockchain technology and data mining techniques for anomaly detection. Applied sciences. 2021, vol. 11, no. 17, 38 str. ISSN 2076-3417. DOI: 10.3390/app11177987. [COBISS.SI-ID 74447619]
- RIAÑO, David, PEČNIK, Špela, JOSEP RAMON, Alonso, KAMIŠALIĆ LATIFIĆ, Aida. Modelling and assessing one- and two-drug dose titrations. Artificial intelligence in medicine. [Print ed.]. Sept. 2022, vol. 131, 9 str., ilustr. ISSN 0933-3657. DOI: 10.1016/j.artmed.2022.102343. [COBISS.SI-ID 113957635] projekt: P2-0057; financer: ARRS projekt: PID2019-105789RB-I00; financer: Spanish Ministry of Science and Innovation
- KAMIŠALIĆ LATIFIĆ, Aida, ŠESTAK, Martina, BERANIČ, Tina. Supporting the sustainability of natural fiber-based value chains of SMEs through digitalization. Sustainability. 1 Oct. 2020, vol. 12, iss. 19, str. 1-19. ISSN 2071-1050. DOI: 10.3390/su12198121. [COBISS.SI-ID 30765059] projekt: P2-0057; financer: ARRS