

UČNI NAČRT PREDMETA / COURSE SYLLABUS (leto / year 2017/18)						
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	
Interdisciplinarni univerzitetni študijski program Računalništvo in matematika	ni smeri			2	prvi	
Interdisciplinary first cycle academic study programme Computer Science and Mathematics	none			2	first	
Vrsta predmeta / Course type				obvezni / compulsory		
Univerzitetna koda predmeta / University course code:				63208		
Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
45		30			105	6
Nosilec predmeta / Lecturer:				prof. dr. Marko Bajec		
Jeziki / Languages:	Predavanja / Lectures:		slovenski / Slovene			
	Vaje / Tutorial:		slovenski / Slovene			
Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:				Prerequisites:		
Vpis v letnik študija.				Enrolment in the programme.		
Vsebina:				Content (Syllabus outline):		

predavanja:

I. Uvod v PB

1. Zgodovina področja,
2. Sistemi za upravljanje s PB (SUPB),
3. Vrste SUPB,
4. Vloge pri upravljanju PB,

II. Opisovanje, shranjevanje ter poizvedovanje v PB

5. tri-nivojska predstavitev podatkov,
6. Shramba in indeksiranje podatkov,
7. Formalni poizvedovalni jeziki,
8. Osnove SQL,
9. Predstavitev QBE,
10. XML PB in XQuery,

III. Osnove načrtovanja PB

11. tri-nivojski pristop k načrtovanju PB,
12. Konceptualno načrtovanje,
13. Logično načrtovanja,
14. Osnove normalizacije,
15. Fizično načrtovanje.
16. Podatkovna skladišča in njihovo načrtovanje

Opcijsko: noSQL in newSQL osnove

lectures:

I. Introduction to DB

1. History of data bases,
2. DB management systems (DBMS),
3. Types of DBMS,
4. Roles in DB Management,

II. Describing, Storing and Querying data in DB

5. 3-tire data representation,
6. Data storing and indexing,
7. Formal query languages,
8. SQL basics,
9. QBE,
10. XML SUPB, XQuery,

III. DB design - basics

11. 3-level data modelling approach,
12. Conceptual data modelling,
13. Logical data modelling,
14. Normalisation - basics,
15. Physical data modelling.
16. Data warehouses and their design,

Optional: noSQL and newSQL basics

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Temeljni literatura in viri / Readings:

Thomas M. Connolly, Carolyn E. Begg (2009). Database Systems, A Practical Approach to Design, Implementation and Management, Fifth Edition, Addison-Wesley.

Raghu Ramakrishnan, Johannes Gehrke (2003). Database Management Systems, Third Edition, McGraw-Hill.

Cilji in kompetence:

Cilj predmeta je študentom računalništva in informatike predstaviti osnove o podatkovnih bazah, kaj so prednosti uporabe podatkovnih baz v primerjavi z drugimi načini shranjevanja podatkov, kako podatkovne baze delujejo in kako upravljamo z njimi, kako poizvedujemo po podatkih v podatkovnih bazah, kako jih načrtujemo ter kako z njimi upravljamo.

Splošne kompetence:

Sposobnost razumevanja in reševanja strokovnih problemov s področja računalništva in informatike.

Sposobnost iskanja virov informacij in kritične evaluacije razpoložljivih virov.

Sposobnost uporabe pridobljenega znanja za samostojno reševanje problemov, sposobnost izpopolnjevanja pridobljenega znanja,

Specifične kompetence:

Objectives and competences:

The aim of this course is to explain students the basics of databases, i.e. advantages of using database systems over using file systems, how databases and database management systems work, how we manage them, how we design databases, how we query databases etc.

General competencies:

The ability to understand and solve professional challenges in computer and information science.

The ability to search knowledge sources and to search for resources and critically evaluate information.

The ability to apply acquired knowledge in independent work for solving technical and scientific problems in computer and information science, the ability to upgrade acquired knowledge.

Specific competencies:

Osnovne spretnosti s področja računalništva in informatike,

Sposobnost prenosa znanja na sodelavce tako v tehničnih kot raziskovalnih skupinah.

Osnovno znanje in spretnosti, ki so potrebni za nadaljevanje študija na drugi bolonjski stopnji.

Basic skills in computer and information science, which includes basic theoretical skills, practical knowledge and skills essential for the field of computer and information science,

The ability to transmit knowledge to co-workers in technology and research groups.

Basic skills in computer and information science, allowing the continuation of studies in the second study cycle.

Predvideni študijski rezultati:

Znanje in razumevanje:

Sposobnost samostojnega razvoja programov, poznavanje osnovnih podatkovnih struktur in algoritmov, sposobnost samostojnega načrtovanja podatkovnih struktur in algoritmov.

Uporaba:

Uporaba naučenih principov pri programiranju in načrtovanju podatkovnih struktur in algoritmov za razvoj obsežnih programskih sistemov.

Refleksija:

Razumevanje osnovnih principov načrtovanja programov in algoritmov in razumevanje njihove vloge pri razvoju programskih sistemov.

Prenosljive spretnosti - niso vezane le na en predmet:

Zmožnost načrtovanja rešitve različnih problemov s programi in algoritmi, zmožnost uporabe naučenih principov pri programiranju v poljubnem programskem jeziku.

Intended learning outcomes:

Knowledge and understanding:

Understanding basic principles of systems for database management. Understanding of database design techniques and approaches. Understanding of formal database query languages. Understanding advantages the use of database management systems brings.

Application:

The use within information system development and development of other computer programs that demand or work with high volumes of data.

Reflection:

Capability for improving modelling techniques, data representation and storing while solving practical problems.

Transferable skills: ability to use domestic and foreign literature, the use of ICT, the use of systematical approaches in solving problems, ability to identification of problems and their resolution, team work.

Metode poučevanja in učenja:

Predavanja, računske vaje z ustnimi nastopi, projektni način dela pri domačih nalogah in seminarjih.

Learning and teaching methods:

Lectures, Practical exercises, homeworks and seminars in team.

Načini ocenjevanja:

Delež (v %) /

Weight (in %)

Assessment:

Način (pisni izpit, ustno izpraševanje, naloge, projekt):	Delež (v %) / Weight (in %)	Type (examination, oral, coursework, project):
Sprotno preverjanje (domače naloge, kolokviji in projektno delo)		Continuing (homework, midterm exams, project work)
Končno preverjanje (pisni in ustni izpit)	50%	Grade for tutorials
Ocene: 6-10 pozitivno, 1-5 negativno (v skladu s Statutom UL)	50%	Final (written and oral exam) Grading: 6-10 pass, 1-5 fail.

Reference nosilca / Lecturer's references:

ŽITNIK, Slavko, ŠUBELJ, Lovro, BAJEC, Marko. SkipCor : skip-mention coreference resolution using linear-chain conditional random fields. PloS one, ISSN 1932-6203, Jun. 2014, vol. 9, no. 6, str. 1-14, ilustr. [COBISS.SI-ID 10645844]

ŠUBELJ, Lovro, FIALA, Dalibor, BAJEC, Marko. Network-based statistical comparison of citation topology of bibliographic databases. Scientific reports, ISSN 2045-2322, 2014, 4, str. 1-10, ilustr. [COBISS.SI-ID 10797140]

FIALA, Dalibor, ŠUBELJ, Lovro, ŽITNIK, Slavko, BAJEC, Marko. Do PageRank-based author rankings outperform simple citation counts?. Journal of informetrics, ISSN 1751-1577, Apr. 2015, vol. 9, no. 2, str. 334-348, ilustr. [COBISS.SI-ID 1536241859]

KRALLINGER, Martin, ŽITNIK, Slavko, BAJEC, Marko, et al. The CHEMDNER corpus of chemicals and drugs and its annotation principles. Journal of cheminformatics, ISSN 1758-2946. [Online ed.], 2015, vol. 7, suppl. 1, str. 1-17, ilustr. [COBISS.SI-ID 1536182211]

ŠUBELJ, Lovro, FIALA, Dalibor, BAJEC, Marko. Network-based statistical comparison of citation topology of bibliographic databases. Scientific reports, ISSN 2045-2322, 2014, 4, str. 1-10, ilustr. [COBISS.SI-ID 10797140]

