

| UČNI NAČRT PREDMETA / COURSE SYLLABUS  |                           |   |                              |   |   |                             |
|--|---------------------------|---|------------------------------|---|---|-----------------------------|
| <b>Predmet:</b>  |                           | Osnove podatkovnih baz                          |                              |   |   |                             |
| <b>Course title:</b>   |                           | Fundamentals of databases                       |                              |   |   |                             |
|  |                           |   |                              |   |   |                             |
| <b>Študijski program in stopnja</b><br>Study programme and level             |                           | <b>Študijska smer</b><br>Study field            |                              | <b>Letnik</b><br>Academic year                |   | <b>Semester</b><br>Semester |
| Univerzitetni študijski program<br>Matematika                                |                           | ni smeri  |                              | 3   |   | drugi                       |
| First cycle academic study<br>programme Mathematics                          |                           | none  |                              | 3   |   | second                      |
| <b>Vrsta predmeta / Course type</b>  |                           |   |                              | izbirni                                       |   |                             |
|  |                           |   |                              |   |   |                             |
| <b>Univerzitetna koda predmeta / University course code:</b>                 |                           |   |                              | M0227   |   |                             |
|  |                           |   |                              |   |   |                             |
| <b>Predavanja</b><br>Lectures  | <b>Seminar</b><br>Seminar | <b>Vaje</b><br>Tutorial                         | <b>Klinične vaje</b><br>work | <b>Druge oblike</b><br>študija                | <b>Samost. delo</b><br>Individ.<br>work | <b>ECTS</b>                 |
| 30   |                           | 30  |                              |   | 90                                      | 5                           |
| <b>Nosilec predmeta / Lecturer:</b>  |                           |   |                              | doc. Alen Orbanič, prof. Andrej Bauer         |   |                             |
|  |                           |   |                              |   |   |                             |
| <b>Jeziki / Languages:</b>   |                           | <b>Predavanja / Lectures:</b> slovenski/Slovene |                              |   |   |                             |
|  |                           | <b>Vaje / Tutorial:</b> slovenski/Slovene       |                              |   |   |                             |
| <b>Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:</b> |                           |   |                              | <b>Prerequisites:</b>                         |   |                             |
| Opravljen predmet Uvod v programiranje.                                      |                           |   |                              | Completed course Introduction to programming. |   |                             |
| <b>Vsebina:</b>  |                           |   |                              | <b>Content (Syllabus outline):</b>            |   |                             |
| Podatkovna baza.   |                           |   |                              | Data based.                                   |   |                             |
| Fizična podatkovna baza.   |                           |   |                              | Physical data base.                           |   |                             |
| Podatkovni modeli.   |                           |   |                              | Data models.                                  |   |                             |

|   |   |
|---|---|
| Relacijski podatkovni model.                | Relational data model.                      |
| Relacijska shema.                           | Relational schema.                          |
| Operacije nad relacijami.                   | Operations on relations.                    |
| Relacijska algebra in relacijski račun.     | Relational algebra and relational calculus. |
| Podatkovni jezik SQL.                       | Database language SQL.                      |
| Obnavljanje podatkovne baze.                | Recovery in databases.                      |
| Nadzor nad sočasno uporabo podatkovne baze. | Control over concurrent use of data base.   |

### Temeljni literatura in viri / Readings:

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|--|
| R. Ramakrishnan, J. Gehrke: Database Management Systems, 3rd edition, McGraw-Hill, Boston, 2003. |
| T. Mohorič: Podatkovne baze, 2. dopolnjena izdaja, BI-TIM, Ljubljana, 2002.                      |
| Priročniki za uporabo podatkovnih baz.   |
| Manuals for databases.   |

### Cilji in kompetence:

Študenti se seznanijo z osnovnimi definicijami podatka in informacije, organizacijo logične in fizične podatkovne baze ter vrsto poglavitnih podatkovnih modelov. Pridobijo znanja s področja povpraševalnih in ažurirnih jezikov, kot je SQL. Podrobneje morajo spoznati tudi delovanje sistema za upravljanje podatkovnih baz.

### Objectives and competences:

Students get familiar with basic definitions of data and information, organization of logical and physical database and with various main data models. They obtain knowledge about querying and updating languages like SQL. They have to obtain detailed knowledge about operation of a system for database management.

### Predvideni študijski rezultati:

Znanje in razumevanje: Osnovno znanje o teoriji in praksi podatkovnih baz.  
 Uporaba: Uporaba podatkovnih baz v informacijskih sistemih in na ostalih področjih računalništva in informatike  
 Refleksija: Matematična teorija relacijske algebre je teoretična osnova za podatkovne

### Intended learning outcomes:

Knowledge and understanding: Basic knowledge about theory and practice about databases.  
 Application: Use of databases in information systems and other fields of computer science and informatics.  
 Reflection: Mathematical theory of relational algebra is a theoretical basis for databases in

baze v praksi. Tu se kaže neposredna uporabnost matematičnega znanja v praksi.

Prenosljive spretnosti – niso vezane le na en predmet: Praktično znanje iz podatkovnih baz povečuje študentove sposobnosti za organizacijo podatkov, tako pri študiju kot v kasnejši zaposlitvi.

practice. This shows direct applicability of mathematical knowledge in practice.

Transferable skills: Practical knowledge on databases enhances student's capabilities for data organization, during the course of study or later at work.

**Metode poučevanja in učenja:**

Predavanja, vaje, domače naloge, konzultacije

**Learning and teaching methods:**

Lectures, exercises, homework, consultations

Delež (v %) /

**Načini ocenjevanja:**

Weight (in %)

**Assessment:**

|   |                    |   |
|---|--------------------|---|
| <p>Način (pisni izpit, ustno izpraševanje, naloge, projekt):<br/>2 kolokvija namesto izpita iz vaj, izpit iz vaj,<br/>izpit iz teorije<br/>ocene: 1-5 (negativno), 6-10 (pozitivno) (po Statutu UL)</p> | <p>50%<br/>50%</p> | <p>Type (examination, oral, coursework, project):<br/>2 midterm exams instead of written exam, written exam<br/>oral exam<br/>grading: 1-5 (fail), 6-10 (pass) (according to the Statute of UL)</p> |
|---|--------------------|---|

**Reference nosilca / Lecturer's references:**

Andrej Bauer:

- BAUER, Andrej, BIRKEDAL, Lars. Continuous functionals of dependent types and equilogical spaces. V: CLOTE, Peter G. (ur.). Computer science logic : 14th international workshop, CSL 2000, annual conference of the EACSL, Fischbachau, Germany, August 21-26, 2000 : proceedings, (Lecture notes in computer science, ISSN 0302-9743, 1862). Berlin [etc.]: Springer, 2000, vol. 1862, str. 202-216 [COBISS.SI-ID 10606681]
- AWODEY, Steve, BAUER, Andrej. Propositions as [Types]. Journal of logic and computation, ISSN

0955-792X, 2004, vol. 14, no. 4, str. 447-471 [COBISS.SI-ID 13374809]

– BAUER, Andrej, STONE, Christopher A. RZ: a tool for bringing constructive and computable mathematics closer to programming practice. *Journal of logic and computation*, ISSN 0955-792X, 2009, vol. 19, no. 1, str. 17-43 [COBISS.SI-ID 15325785]

Alen Orbanić:

– PERME, Tomaž, NOVAK, Matjaž, STRAŠEK, Rok, KAVKLER, Iztok, ORBANIĆ, Alen. A model for technical optimisation of the distribution centre, 2011, *Acta technica corviniensis*, tome 4, fasc. 2, str. 39-43 [COBISS.SI-ID 4154583]

– ORBANIĆ, Alen, BOBEN, Marko, JAKLIČ, Gašper, PISANSKI, Tomaž. Algorithms for drawing polyhedra from 3-connected planar graphs. *Informatica*, ISSN 0350-5596, 2004, vol. 28, no. 3, str. 239-243 [COBISS.SI-ID 13285977]

– HUBARD, Isabel, ORBANIĆ, Alen, PELLICER, Daniel, IVIĆ WEISS, Asia. Symmetries of equivelar 4-toroids. *Discrete & computational geometry*, ISSN 0179-5376, 2012, vol. 48, iss. 4, str. 1110-1136 [COBISS.SI-ID 16478297]