

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Razvoj programskih rešitev za mala podjetja
Course title:	Development of Solutions for Small Companies

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Računalništvo in spletne tehnologije, visokošolski strokovni študijski program prve stopnje	-	Drugi ali tretji	Četrty ali šesti
Computer Science and Web Technologies, first cycle Professional Study Programme	-	Second or third	Fourth or sixth

Vrsta predmeta / Course type Izbirni / Elective

Univerzitetna koda predmeta / University course code: 2-RST-VS-IP-RPRMP-2020-05-14

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	-	45	-	-	105	6

Nosilec predmeta / Lecturer: prof. dr. Srđan Škrbić

Jeziki / Languages:

Predavanja / Lectures:	Slovenski / Slovenian, Angleški / English
Vaje / Tutorial:	Slovenski / Slovenian, Angleški / English

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

Študent/študentka mora poznati osnove programiranja in podatkovnih baz.

Študent/študentka mora pred pristopom k izpitu pripraviti in zagovarjati projekt.

Prerequisites:

Student needs basic knowledge of programming and databases.

Student has to elaborate and present the project before taking the exam.

Vsebina:

Poglavja predmeta obsegajo naslednje teme:

- Posebnosti poslovanja malih podjetij.
- Posebnosti informatizacije malih podjetij.
- Vrste pristopov pri razvijanju programskih rešitev.
- Prototipni pristop kot alternativa za mala podjetja.

Content (Syllabus outline):

Course topics:

- Special features of small businesses.
- Special features of the computerization of small businesses.
- The types of approaches in developing software solutions.
- Prototyping as an alternative for small businesses.

- Projekt: celovita rešitev praktičnega problema za potrebe malega ali mikro podjetja s pomočjo izbranega orodja.

- Project: a complete solution of a real challenge for a small company by using appropriate tool.

Temeljna literatura in viri / Readings:

- Oktaba, H. & Piattini, M. (2008). *Software Process Improvement for Small and Medium Enterprises: Techniques and Case Studies*. IGI Global.
- Bhattacharyya, S. & Dan P. K. (2012). *An Open Source ERP Software Development for Small Scale Enterprises: Smart Solution for Smart Business : Implement ERP*. Lap Lambert Academic Publishing.
- Burges, S. (2002). *Managing information technology in small business*. Idea Group, Hershey (PA) Information Science.
- Connolly, T. & Begg, C. (2010). *Database Systems*. Addison-Wesley.
- Harris, R. A. (2002). *Creative Problem Solving. A step-by-Step Approach*. Pyrczak Publishing.
- Poppendieck, M. & Poppendieck, T. (2003). *Lean Software Development, An Agile Toolkit*. Addison Wesley.

Cilji in kompetence:

Cilj predmeta je spoznati posebnosti organiziranja malih in mikro podjetij ter njihovih informacijskih sistemov, spoznati posebnosti vloge informatikov v malih podjetjih, spoznati načine razvoja in prenove programskih rešitev v malih podjetjih, spoznati prototipni pristop kot eno od metod razvoja programskih rešitev za mala podjetja, spoznati prednosti in slabosti skupinskega dela, izdelati manjšo delujočo programsko rešitev.

Predmet prispeva k razvoju naslednjih splošnih in predmetno-specifičnih kompetenc:

Splošne kompetence:

- poznavanje in razumevanje procesov, ki jih je mogoče informacijsko podpreti z uporabo spletnih tehnologij, ter sposobnost za njihovo analizo, sintezo in predvidevanje rešitev ter njihovih posledic
- zmožnost skupinskega dela v vseh fazah razvoja spletnih in mobilnih rešitev
- prepoznavanje in ocenitev aktualnih in nastajajočih tehnologij ter ocenitev njihove uporabnosti za reševanje potreb uporabnikov
- zmožnost za prepoznavanje in izkoriščanje priložnosti, ki jih ponuja spletna tehnologija

Objectives and competences:

The objective of this course is to meet specifics of organization of small and micro enterprises and their information systems. Then to meet specific roles of IT personal in small businesses, learn ways of development of software solutions for small businesses, learn prototyping approach as one of the methods for developing software solutions for small businesses, realize the benefits and disadvantages of group work, and in the end to develop a small functional software solution.

The instructional unit contributes to the development of the following general and subject-specific competences:

General competences:

- familiarity with and understanding of processes allowing information-aided use of web technologies, and the ability to analyse and synthesize them as well as predict solutions and their consequences
- ability to operate within a team during all phases of development of web and mobile solutions
- identification and evaluation of current and emerging technologies, and assessment of their usability in terms of fulfilling user requirements

- sposobnost fleksibilne uporabe znanja v praksi
- razvoj kritične in samokritične presoje.
- sposobnost pridobivanja, selekcije, ocenjevanja in umeščanja novih informacij in zmožnost interpretacije v ustreznem kontekstu

Predmetno-specifične kompetence:

- sposobnost samostojnega reševanja realnih problemov s pomočjo računalniškega programiranja
- sposobnost samostojnega reševanja realnih problemov z uporabo primernih podatkovnih struktur in algoritmov
- sposobnost uporabe tehnik za zajem zahtev IS
- sposobnost izbire/uporabe informacijsko-komunikacijske tehnologije, orodij in sistemov za načrtovanje IS (informacijskih sistemov)
- pridobivanje uporabniških zahtev in definicije specifikacij rešitev
- sposobnost razumevanja zahtev končnih uporabnikov oz. prepoznavanja priložnosti za nove spletne storitve in pretvorba s tem povezanih vsebinskih zahtev v tehniške specifikacije
- sposobnost spoznavanja in uporabe aktualnih tehnoloških konceptov in praks ključnih informacijsko komunikacijskih tehnologij
- sposobnost kreativnega (inovativnega) reševanja problemov
- poznavanje vseh poglavitnih elektronskih poslovnih komunikacijskih orodij in njihova učinkovita uporaba
- izdelava delujoče vzorčne spletne aplikacije (klient-strežnik-podatkovna baza)
- sposobnost sodelovanja v projektih za izdelavo spletnih strani in aplikacij

- ability to recognize and seize opportunities offered by the web technology
- ability to use the acquired knowledge in practice in a flexible manner.
- development of critical and self-critical judgement
- ability to find, select, evaluate and position the new information as well as appropriate, context-aware interpretation

Subject-specific competences:

- ability to autonomously solve real life problems with computer programming
- ability to independently solve real problems by using adequate data structures and algorithms
- ability to use appropriate tools and techniques for develop software specification requirements
- ability to choose information and communication technologies, tools and systems for designing and implementing information system
- acquire user requirements and define solution specifications
- ability to understand the final user requirements or identify opportunities for new web services and conversion of related substantive requirements into technical specifications
- ability to recognize and use the current technological concepts and practices of key information and communication technologies
- ability for creative problem solving (innovative thinking)
- familiarity with all principal electronic business communication tools and their effective use
- manufacture of an operational web application sample (client-server-database)
- ability to participate in web design and application development projects

Predvideni študijski rezultati:

Znanje in razumevanje:

Študent/študentka:

- se seznaniti s posebnostmi malih podjetij ter specifikami razvoja programskih rešitev v malih podjetjih

Intended learning outcomes:

Knowledge and understanding:

The student will:

- be acquainted with the peculiarities of small businesses and specifics in the

- razume osnovne principe, na katerih temeljijo postopki za izdelavo prototipne rešitve
- razume osnovne principe skupinskega dela
- se nauči analiziranja obstoječega stanja, definirati ključne probleme, načrtovati razvoj ali nabavo programske rešitve
- obnovi znanja s področja normalizacije podatkovnih baz do tretje normalne forme
- se nauči pravilno in samostojno uporabljati izbrano programsko orodje za izdelavo prototipne rešitve
- se nauči predstavljati in zagovarjati svoje delo v javnosti

- development of software solutions for small businesses
- understand the basic principles for making prototype
 - understand the basic principles of teamwork
 - learn to analyse the current state, define key issues, plan development or purchase of software solutions
 - review the knowledge of relational data bases and normalization to third normal form
 - learn how to properly and independently select suitable software tools in order to produce the prototype
 - learn to represent and argue their work in public

Metode poučevanja in učenja:

- *predavanja* z aktivno udeležbo študentov (problemsko zasnovan študij, študenti sami proučijo del snovi in jo podajo ostalim študentom, razlaga, diskusija, vprašanja, primeri, reševanje problemov)
- *vaje v računalniški učilnici*: pri teh vajah bodo študentje spoznali aktualna programska orodja za izdelavo prototipne rešitve in jih uporabili za reševanje konkretnih problemov iz malih podjetij. vaje bodo potekale v parih
- *projekti*, ki jih bodo pari študentov pripravili, se bodo znotraj manjših skupinah evalvirali in analizirali ter z delom v skupini (izmenjava mnenj, kritična analiza, ocena) izboljšali. Vključeval bo konkreten problem s področja poslovanja malih/mikro podjetij, ki ga bodo morali študenti z izbiro pravega orodja v parih obdelati

Learning and teaching methods:

- *lectures* with the active participation of students (problem-based learning, self-learning of a piece of material and then explaining to the rest of the students, discussion, questions, case-studies, creative problem solving)
- *exercises in the computer lab*: in these exercises, students will learn about current software tools to produce prototype and use them to solve real problems of small businesses. exercises will be held in pairs
- *projects* will be evaluated within small groups, analysed (an exchange of views, critical analysis, evaluation) and improved. Projects will be focused to real problems in the area of small business / micro-business. The students will have to choose the right tools in order to achieve workable solution

Delež (v %) /

Weight (in %)

Načini ocenjevanja:

Assessment:

Način (pisni izpit, ustno izpraševanje, naloge, projekt):	Delež (v %) / Weight (in %)	Type (examination, oral, coursework, project):
● projekt I. del. (projektni načrt)	30	● project, Part I. (project plan)
● projekt II. del. (izvedba projekta)	30	● project, Part II. (project execution)
● pisni izpit	40	● written exam

Reference nosilca / Lecturer's references:

- Zarko Bodroski, Nenad Vukmirovic, Srdjan Skrbic: Gaussian basis implementation of the charge patching method. *Journal of Computational Physics*, Volume 368, 2018, Pages 196-209
- Vladimir Loncar, Luis E. Young-S., Srdjan Skrbic, Paulsamy Muruganandam, Sadhan K. Adhikari, Antun Balaz: OpenMP, OpenMP/MPI, and CUDA/MPI C programs for solving the time-dependent dipolar Gross-Pitaevskii equation. *Computer Physics Communications* 209: 190-196 (2016)
- Loncar Vladimir, Balaz Antun, Bogojevic Aleksandar, Skrbic Srdjan, Muruganandam Paulsamy, Adhikari Sadhan: CUDA programs for solving the time-dependent dipolar Gross-Pitaevskii equation in an anisotropic trap, *Computer Physics Communications*, No. 200, pp. 406-410, 2016.
- Fodor Lidija, Skrbic Srdjan: A performance analysis of the R language and an assessment of the capabilities for its improvement, *Proceedings of the 5th International Conference on Information Society and Technology*, pp. 449-454, 2015.
- Loncar Vladimir, Skrbic Srdjan, Balaz Antun: Parallelization of Minimum Spanning Tree Algorithms Using Distributed Memory Architectures, *Transactions on Engineering Technologies*, pp. 543-554, 2014.
- Loncar Vladimir, Skrbic Srdjan, Balaz Antun: Distributed Memory Parallel Algorithms for Minimum Spanning Trees, *Proceedings of the World Congress on Engineering 2013, Vol II*, pp. 1271-1275, 2013.
- Panic Goran, Rackovic Milos, Skrbic Srdjan: Fuzzy XML and prioritized fuzzy XQuery with implementation, *Journal of Intelligent and Fuzzy Systems*, Vol. 26, No. 1, pp. 303-316, 2014.
- Skrbic Srdjan, Rackovic Milos, Takaci Aleksandar: Prioritized fuzzy logic based information processing in relational databases, *Knowledge-based Systems*, Vol. 38, pp. 62-73, 2013.
- Skrbic Srdjan, Rackovic Milos, Takaci Aleksandar: Towards the Methodology for Development of Fuzzy Relational Database Applications, *Computer Science and Information Systems*, Vol 8, No 1, pp. 27-40, 2011.
- Perovic Aleksandar, Takaci Aleksandar, Skrbic Srdjan: Formalising PFSQL queries using LP1/2 fuzzy logic, *Mathematical Structures in Computer Science*, Vol 22, No 3, pp. 533-547, 2012
- Takaci Aleksandar, Skrbic Srdjan: Data Model of FRDB with Different Data Types and PFSQL, *Handbook of Research on Fuzzy Information Processing in Databases*, IGI Global, Hershey, PA, pp. 407-434, 2008.
- Skrbic Srdjan, Surla Dusan: Bibliographic records editor in XML native environment, *Software: Practice and Experience*, Vol 38, No 5, pp. 471-491, 2008.