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
Informatika v sodobni družbi, visokošolski strokovni študijski program prve stopnje	-	Drugi	Četrti
Informatics in Contemporary Society, first cycle Professional Study Programme	-	Second	Fourth

Vrsta predmeta / Course type	Izbirni / Elective

Univerzitetna koda predmeta / University course code:	1-ISD-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:	Prerequisits:
Študent/študentka mora poznati osnove programiranja in podatkovnih baz. Študent/študentka mora pred pristopom k izpitu pripraviti in zagovarjati projekt.	Student needs basic knowledge of programming and databases. Student has to elaborate and present the project before taking the exam.

Vsebina:	Content (Syllabus outline):
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.	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.

Temeljni 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 rešitve 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:

- zmožnost vzpostavljanja in vzdrževanja odnosov za delo v skupini in z drugimi uporabniki ter skupinami (lokalna skupnost, organizacije javne uprave, gospodarstvo, nevladne organizacije)
- poznavanje in razumevanje interakcij med informacijsko komunikacijsko tehnologijo in sodobno družbo
- sposobnost fleksibilne in aplikativne uporabe teoretičnega znanja
- razvoj (samo)kritične presoje
- poznavanje in razumevanje širokega nabora aplikacij informacijsko komunikacijske tehnologije v sodobni družbi

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:

- ability to establish and maintain relationships for group-work as well as with other users and groups (local communities, public administration organizations, industry, non-governmental organizations)
- knowledge and understanding of interactions between ICT and the modern society
- ability to flexibly apply knowledge in practice
- development of (self)critical judgement
- knowledge and understanding of a wide range of applications of

• organizacijske in vodstvene spretnosti za organiziranje aktivnega in samostojnega dela • zmožnost za prepoznavanje in izkoriščanje priložnosti, ki se ponujajo v delovnem in družbenem okolju (ki se izkazujejo kot podjetniški duh in aktivno državljanstvo • sposobnost pridobivanja, selekcije, ocenjevanja in umeščanja novih informacij in zmožnost interpretacije v kontekstu družboslovja • sposobnost zapisati problem v obliki algoritma in pretvorba algoritma v računalniški program z uporabo sodobnih programskih orodij • razumevanje in uporaba računalniških sistemov in arhitektur, • načrtovanje in obvladovanje sprememb ob oblikovanju celovite ocene stanja v organizaciji ali družbenem okolju z upoštevanjem različnih dejavnikov • razvoj in uporaba komunikacijskih sposobnosti in spretnosti, posebej komunikacije v mednarodnem okolju	• information communication technology in the modern society • managerial and leadership skills for organizing active and autonomious work • the ability to recognise and take advantage of the opportunities, arising in work and social environment (and shown as the entrepreneurial spirit and active citizenship) • the ability to acquire, select, evaluate and place new information and the ability to interpret within the context of social sciences • the ability to write the problem in the form of an algorithm and converting the algorithm into a computer program using modern programming tools • understanding and use of computer systems and architectures • planning and management of changes in the formation of a comprehensive evaluation of state in an institution or social environment with the consideration of various factors • the development and application of communication skills and abilities, in particular communication in an international environment

Predvideni študijski rezultati:

Intended learning outcomes:

Znanje in razumevanje: *Študent/študentka:* • se seznani s posebnostmi malih podjetij ter specifikami razvoja programskih rešitev v malih podjetjih • 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 orodij za izdelavo prototipne rešitve	Knowledge and understanding: *The student will:* • be acquainted with the peculiarities of small businesses and specifics in the 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 argument their work in public

• se nauči predstavljati in zagovarjati svoje delo v javnosti	

Metode poučevanja in učenja:

Learning and teaching methods:

• *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 pravilnega orodja v parih obdelati	• *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

Načini ocenjevanja:

Delež (v %) / Weight (in %)

Assessment:

Način (pisni izpit, ustno izpraševanje, naloge, projekt):		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 onInformation 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.