UČNI NAČRT PREDMETA / COURSE SYLLABUS (leto / year 2017/18)	
Predmet:	Računalništvo 2
Course title:	Computer science 2

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Visokošolski strokovni študijski program Praktična matematika	ni smeri	3	drugi
First cycle professional study programme Practical Mathematics	none	3	second

Vrsta predmeta / Course type	izbirni / elective

Univerzitetna koda predmeta / University course code:	M0439

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30		30			90	5

Nosilec predmeta / Lecturer:	prof. dr. Sergio Cabello Justo, viš. pred. mag. Matija Lokar, prof. dr. Marko Petkovšek

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. Opravljen predmet Programiranje 2.	Enrolment in the programme. Completed course Programming 2.

Vsebina:	Content (Syllabus outline):

Zahtevnejše podatkovne strukture. Tabela, vrsta s prednostjo. Kopica. Uravnotežena drevesa. Zgoščena tabela. Iskalna drevesa. B-drevesa.	Complex data structures. Priority queue. Heap. Balanced trees. Hashing. Search trees. B-trees.

Temeljni literatura in viri / Readings:

T. H. Cormen, C. E. Leiserson, R. L. Rivest, C. Stein: Introduction to Algorithms, 2. izdaja, MIT Press, Cambridge, 2001.

I. Kononenko, M. Robnik Šikonja: Algoritmi in podatkovne strukture I, 1. izdaja, Fakulteta za računalništvo in informatiko, Ljubljana, 2003.

I. Kononenko, M. Robnik Šikonja: Algoritmi in podatkovne strukture II, 1. izdaja, Fakulteta za računalništvo in informatiko, Ljubljana, 2004.

J. Kozak: Podatkovne strukture in algoritmi, DMFA založništvo, Ljubljana, 1997.

Spletne strani in tečaji (Coursera, Udacity, Edx ...) s tega področja, izbor je vsakoletno osvežen na spletni strani predmeta.

Zapiski s predavanj, gradivo za vaje in ostalo gradivo v spletni učilnici predmeta.

Web sites and courses (Coursera, Udacity, Edx ...), selection is annually refreshed on the Web site of the subject.

Notes from lectures, tutorials and other resources in the online classroom.

Cilji in kompetence:

Objectives and competences:

Študenti bodo spoznali dodatne podatkov strukture in algoritme. Samostojno bodo proučili novo podatkovno strukturo ali algoritem in pripravili njeno predstavitev. Podatkovno strukturo ali algoritem bodo sposobni uporabiti pri reševanju primernih problemov.	Students will study additional data structures and algorithms. Independently they will study a new data structure or algorithm and prepare its presentation. They will be able to use the data structures or algorithms addressing the specific problems.

Predvideni študijski rezultati:

Intended learning outcomes:

Znanje in razumevanje: Študent razvije sposobnost samostojnega spoznavanja s podatkovnimi strukturami in algoritmi. Sposoben je pripraviti poročilo o algoritmičnem reševanju določenega problema. Uporaba: Študent je sposoben snovanja učinkovitih računalniških programov in napovedovanja njihovega obnašanja. Refleksija: Študent razvije sposobnost povezovanja teoretičnih in praktičnih postopkov pri razvoju algoritmov Prenosljive spretnosti – niso vezane le na en predmet: Predmet se povezuje s predmetom Računalništvo 1.	Knowledge and understanding: The student develops the ability to independently studies a new data structure and algorithm. He is able to prepare a report on algorithmic solution of a certain problem. Application: The student is able to design effective computer programs and to predict their behavior. Reflection: The student develops the ability of integration of theoretical and practical procedures in the development of algorithms Transferable skills: The subject is connected with Computing Science 1.

Metode poučevanja in učenja: **Learning and teaching methods:**

predavanja, vaje, uporaba metod študija na daljavo, domače naloge, konzultacije	Lectures, exercises, usage of distance learning techniques, home works, consultations

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
študenti dobijo eno oceno iz projekta ocene: 1-5 (negativno), 6-10 (pozitivno) (po Statutu UL)	100%	Students receive one grade from the project. Grading: 1-5 (fail), 6-10 (pass) (according to the Statute of UL)

Reference nosilca / Lecturer's references:

Sergio Cabello:

CABELLO, Sergio, CHAMBERS, Erin W., ERICKSON, Jeff. Multiple-source shortest paths in embedded graphs. SIAM journal on computing, ISSN 0097-5397, 2013, vol. 42, no. 4, str. 1542-1571. [COBISS.SI-ID 16668761]

CABELLO, Sergio. Many distances in planar graphs. Algorithmica, ISSN 0178-4617, 2012, vol. 62, no. 1-2, str. 361-381. [COBISS.SI-ID 15702873]

Sergio Cabello:

BERG, Mark de, CABELLO, Sergio, HAR-PELED, Sariel. Covering many or few points with unit disks. Theory of computing systems, ISSN 1432-4350, 2009, vol. 45, no. 3, str. 446-469. [COBISS.SI-ID 14900825]

Matija Lokar:

MARKOVIČ, Katja. Izdelava vodičev za uporabo programa GeoGebra : diplomska naloga. Ljubljana: [K. Markovič], 2011. 73 f., ilustr. [COBISS.SI-ID 16189529]

LOKAR, Matija. Designing tasks for CAS/DGS classrooms. V: TIME 2010, Technology and its Integration into Mathematics Education, July 6th-10th, 2010, Málaga, Spain. Proceedings of TIME 2010 : Technology and its Integration into Mathematics Education. Málaga: Universidad de Málaga, 2011, 17 str. [COBISS.SI-ID 15643993]

LOKAR, Matija. Some issues on designing tasks for CAS classrooms. V: 6th Came symposium: structured abstracts : 16-17 July 2009, Megatrend University, Belgrade, Serbia. Beograd: Megatrend University, 2009, str. 15-16. [COBISS.SI-ID 15241817]

KUDREVIČIUS, Evelina. Platforma SharePoint in oblikovanje glavne strani : diplomska naloga. Ljubljana: [E. Kudrevičius], 2008. 77 f., ilustr. [COBISS.SI-ID 15105625]

LOKAR, Matija. Prvenstvo študentskih ekip Univerze v Ljubljani v programiranju 2002. Ljubljana: [Fakulteta za matematiko in fiziko], 2002. 100 str., ilustr. [COBISS.SI-ID 12122457]

Marko Petkovšek:

PETKOVŠEK, Marko. Hypergeometric solutions of linear difference equations with polynomial coefficients. Journal of symbolic computation, ISSN 0747-7171, 1992, let. 14, str. 243-264. [COBISS.SI-ID 8044633]

PETKOVŠEK, Marko. A generalization of Gosper's algorithm. Discrete Mathematics, ISSN 0012-365X. [Print ed.], 1994, vol. 134, iss. 1-3, str. 125-131. [COBISS.SI-ID 8048217]

NEMES, István, PETKOVŠEK, Marko. RComp: a Mathematica package for computing with recursive sequences. Journal of symbolic computation, ISSN 0747-7171, 1995, let. 20, str. 745-753.

[COBISS.SI-ID 6974809]

PETKOVŠEK, Marko, WILF, Herbert S., ZEILBERGER, Doron. A=B. Wellesley (Massachusetts): A. K. Peters, cop. 1996. VII, 212 str. ISBN 1-56881-063-6. [COBISS.SI-ID 4085337]