

UČNI NAČRT PREDMETA / COURSE SYLLABUS (leto / year 2017/18)						
<b>Predmet:</b>		Programiranje 2				
<b>Course title:</b>		Programming 2				
<b>Študijski program in stopnja</b> Study programme and level		<b>Študijska smer</b> Study field		<b>Letnik</b> Academic year	<b>Semester</b> Semester	
Visokošolski strokovni študijski program Praktična matematika		ni smeri		2	drugi	
First cycle professional study programme Practical Mathematics		none		2	second	
<b>Vrsta predmeta / Course type</b>				obvezni / compulsory		
<b>Univerzitetna koda predmeta / University course code:</b>				M0420		
<b>Predavanja</b> Lectures	<b>Seminar</b> Seminar	<b>Vaje</b> Tutorial	<b>Klinične vaje</b> work	<b>Druge oblike študija</b>	<b>Samost. delo</b> Individ. work	<b>ECTS</b>
30		30			90	5
<b>Nosilec predmeta / Lecturer:</b>		prof. dr. Andrej Bauer, viš. pred. mag. Matija Lokar				
<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>		
Vpis v letnik študija.				Enrolment in the programme.		
Opravljen predmet Programiranje 1.				Completed course Programming 1.		
<b>Vsebina:</b>				<b>Content (Syllabus outline):</b>		

<p>Objektno programiranje, enkapsulacija, dedovanje. Modularno programiranje, načrtovanje in organizacija večjih programskih enot. Vmesniki, enkapsulacija, generično programiranje in paketi. Grafični uporabniški vmesniki, dogodkovno programiranje.</p>	<p>Object-oriented programming, encapsulation, inheritance.</p> <p>Modular programming, planning and organisation of programming units.</p> <p>Interfaces, encapsulation, generic programming and packages.</p> <p>Graphical user interfaces, event driven programming.</p>
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### **Temeljni literatura in viri / Readings:**

<p>Priročniki in učbeniki za programske jezike, ki jih študenti spoznajo.</p> <p>Spletne strani in tečaji (Coursera, Udacity, Edx ...) za učenje programskega jezika, izbor je vsakoletno osvežen na spletni strani predmeta.</p> <p>Zapiski s predavanj, gradivo za vaje in ostalo gradivo v spletni učilnici predmeta.</p> <p>Zaradi hitrega razvoja informacijskih tehnologij se literatura in viri redno prilagajajo razvoju programskih jezikov in didaktike poučevanja le teh. Konkretni naslovi, ki bi jih navedli, bi bili v času izvajanja že zastareli.</p> <p>Manuals and textbooks for programming languages.</p> <p>Web sites and courses (Coursera, Udacity, Edx...), selection is annually refreshed on the Web site of the subject.</p> <p>Notes from lectures, tutorials and other resources in the online classroom.</p> <p>References and resources are refreshed regularly to address the development of programming languages and the didactics of teaching. Specific resources listed would have been at the time of the implementation already obsolete.</p>
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### **Cilji in kompetence:**

<p>Študenti bodo spoznali in se naučili naprednejših tehnik programiranja, kot so objektno in dogodkovno usmerjeno programiranje. S pomočjo računalnika bodo sposobni reševati kompleksnejše matematične probleme in probleme iz realnega življenja.</p>
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### **Objectives and competences:**

<p>Students will learn advanced programming techniques such as object-oriented and event-driven programming. With the help of a computer they will be able to solve complex mathematical problems and problems from real life.</p>
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**Predvideni študijski rezultati:**

Znanje in razumevanje: Načrtovanje razredov, uporaba objektov, modularizacija programske kode.

Uporaba:

Naprednejše programerske sposobnosti študent uporabi pri reševanju problemov pri predmetih iz področja računalništva in numeričnih metod.

Refleksija: Raznovrstnost konceptov in orodij v programiranju zahteva širok spekter znanja in njegovo nenehno osveževanje.

Prenosljive spretnosti – niso vezane le na en predmet:

Sposobnost načrtovanja večjih programskih enot. Način pristopa k obravnavi problemov, pomemben za študij podatkovnih struktur in algoritmov.

**Intended learning outcomes:**

Knowledge and understanding:

Class design, use of the objects, modularization of the software code.

Application:

Advanced programming skills are used in solving problems from various fields in computing and numerical methods.

Reflection:

Diversity in programming concepts and tools requires a wide range of knowledge and its constant refreshment.

Transferable skills:

Ability to plan bigger programming units. Study of the approach needed to deal with issues relevant to the study of data structures and algorithms.

**Metode poučevanja in učenja:**

predavanja, vaje, uporaba metod študija na daljavo, domače naloge, konzultacije

**Learning and teaching methods:**

Lectures, exercises, usage of distance learning techniques, home works, consultations

**Načini ocenjevanja:**

Delež (v %) /

Weight (in %)

**Assessment:**

Način (pisni izpit, ustno izpraševanje, naloge, sem. naloga):

50%

Type (examination, oral, coursework, project):

domače naloge (pogoj za pristop k pisnemu izpitu)

50%

home works (requirement for taking the written exam)

izpit iz vaj (kolokviji ali pisni izpit)

midterm exams instead of written exam,

<p>seminarska naloga</p> <p>ustni izpit – zagovor seminarske naloge</p> <p>Študentje dobijo dve oceni:</p> <p>eno iz izpita iz vaj ter domačih nalog,</p> <p>drugo iz seminarske naloge in ustnega izpita.</p> <p>Ocene: 1-5 (negativno), 6-10 (pozitivno) (po Statutu UL)</p>		<p>written exam</p> <p>oral exam – the presentation of term paper</p> <p>Students receive two grades: one from the written exam and home works and the other from the oral exam.</p> <p>Grading: 1-5 (fail), 6-10 (pass) (according to the Statute of UL)</p>
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**Reference nosilca / Lecturer's references:**

Andrej Bauer:

HAJDINJAK, Melita, BAUER, Andrej. Similarity-based relations in Datalog programs. International journal of uncertainty, fuzziness and knowledge-based systems, ISSN 0218-4885, Oct. 2012, vol. 20, no. 5, str. 673-700. [COBISS.SI-ID 9428308]

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]

LUKŠIČ, Primož, HORVAT, Boris, BAUER, Andrej, PISANSKI, Tomaž. Practical E-Learning for the Faculty of Mathematics and Physics at the University of Ljubljana. Interdisciplinary journal of knowledge & learning objects, ISSN 1552-2210, 2007, vol. 3, str. 73-83. [COBISS.SI-ID 14269529]

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]

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]