

UČNI NAČRT PREDMETA / COURSE SYLLABUS (leto / year 2016/17)						
Predmet:		Zanesljivost in zmogljivost računalniških sistemov				
Course title:		Computer systems reliability and performance				
Študijski program in stopnja Study programme and level		Študijska smer Study field		Letnik Academic year	Semester Semester	
Interdisciplinarni univerzitetni študijski program Računalništvo in matematika		ni smeri		3	drugi	
Interdisciplinary first cycle academic study programme Computer Science and Mathematics		none		3	second	
Vrsta predmeta / Course type				izbirni / elective		
Univerzitetna koda predmeta / University course code:				63262		
Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
45	20	10			105	6
Nosilec predmeta / Lecturer:				prof. dr. Miha Mraz		
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.				Enrolment in the programme.		
Vsebina:				Content (Syllabus outline):		

<p>Predavanja:</p> <p>1. Zanesljivost rač. sistemov</p> <p>Osnovni pojmi (napaka, odpoved, redundanca, MTBF, MTTR, MTTF, degradirano delovanje, nedelujoče stanje sistema, itd.)</p> <p>Matematično teoretične osnove zanesljivosti</p> <p>Modeliranje zanesljivosti</p> <p>Zanesljivost elektronskih komponent – pregled standardov</p> <p>Zanesljivost programske opreme</p> <p>Osnove sistemske zanesljivosti</p> <p>Diagnostika v računalniških sistemih</p> <p>Pregled konkretnih metod za določevanje zanesljivosti (FMEA, FTA, itd.)</p> <p>Pregled programskih orodij za določevanje zanesljivosti</p> <p>2. Zmogljivost rač. sistemov</p> <p>Metrike za ocenjevanje zmogljivosti</p> <p>Bremena v računalniških sistemih</p> <p>Metode za ocenjevanje zmogljivosti (analitični, simulacijski ali meritveni pristop)</p> <p>Monitorji</p> <p>Koncepti določanja zmogljivosti: meritve, simulacije, analitični pristop</p> <p>Postopki za pohiritev programske opreme</p>	<p>Lectures:</p> <p>1. Reliability of computer systems</p> <p>Basic terms (error, failure, redundancy, MTBF, MTTR, MTTF, performance degradation, system failure, etc.)</p> <p>Mathematical theory in reliability estimation</p> <p>Modelling the reliability</p> <p>Reliability assessment of electronic components – overview of the standards available</p> <p>Software reliability</p> <p>Basics of system reliability</p> <p>Computer diagnostics</p> <p>Overview of selected methods for reliability assessment (FMEA, FTA, etc.)</p> <p>Overview of software tools for reliability assessment</p> <p>2. Performance of computer systems</p> <p>Metrics for performance evaluation</p> <p>Work-loads in computer systems</p> <p>Methods for performance evaluation (analytical, simulational and measurement approach)</p> <p>Computer system performance monitoring</p> <p>Performance evaluation concepts: measurements, simulations, analytical approach</p> <p>Methods for improving the system performance</p> <p>Memory hierarchies</p>
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<p>Pomnilniške hierarhije</p> <p>Zmogljivost računalniških omrežij</p> <p>Vaje:</p> <p>Namen vaj pri navedenem predmetu je predvsem v predstavitvi uporabe zgoraj navedenih metod in pristopov na praktičnih primerih iz realnega sveta. V ta namen se bodo uporabljala na vajah ustrezna programska orodja (npr. Relex, Reliability Workbench itd.).</p>	<p>Capabilities of computer systems</p> <p>Laboratory courses:</p> <p>Methods and approaches presented during the lectures will be demonstrated on practical real-world examples during the laboratory courses. Different software tools will be used for the demonstrations, such as Relex, Reliability Workbench etc.</p>
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Temeljni literatura in viri / Readings:

<ol style="list-style-type: none"> 1. M. L Shooman: Reliability of computer systems and networks, J. Wiley &, Sons, New York 2002. 2. N. Zimic, M. Mraz: Temelji zmogljivosti računalniških sistemov, Fakulteta za rač. in informatiko, Ljubljana, 2006.

Cilji in kompetence:

<p>Cilj predmeta je študentom računalništva in informatike predstaviti osnovne metode in pristope na področjih računalniške zanesljivosti in zmogljivosti. Obe sta ključni za uspešnost delovanja kakršnegakoli računalniškega sistema. Predmet naj bi študentom podal tako teoretične osnove in metode obeh področij, kot tudi skušal čim boljše predstaviti uporabo teoretičnih osnov in metod na konkretnih problemih načrtovanja in vzdrževanja računalniških sistemov. Ostale kompetence:</p> <p>Razvoj spretnosti v analitičnem in sinteznem razmišljanju.</p> <p>Sposobnost razumevanja in reševanja profesionalnih problemov</p> <p>Zmožnost profesionalne komunikacije v materinem in tujem jeziku.</p>

Objectives and competences:

<p>Objective of the course is to present the basic methods and approaches from the field of reliability and performance of computer systems assessment to the students of computer and information science. Reliability and performance of computer system are vital for its effectivity. Students will comprehend theoretical knowledge from both disciplines and will also learn their practical values from the examples of real-life problems. Other competences:</p> <p>Developing skills in critical, analytical and synthetic thinking.</p> <p>The ability to understand and solve professional challenges in computer and information science.</p> <p>The ability of professional communication in the native language as well as a foreign language.</p>

Zmožnost uporabe in nadgradnje znanja pri samostojnem delu

Zmožnost timskega dela v profesionalnem okolju, upravljanje manjših delovnih enot

The ability to apply acquired knowledge in independent work for solving technical and scientific problems in computer and information science, the ability to upgrade acquired knowledge.

The ability of teamwork within the professional environment, management of a small professional team.

Predvideni študijski rezultati:

Znanje in razumevanje: Poznavanje metod, tehnik in orodij poslovne inteligence.

Uporaba: Uporaba tehnik poslovne inteligence v informacijski sistemih in spletnih okoljih.

Refleksija: Sposobnost prepoznavanja priložnosti in niš, kjer lahko s tehnikami poslovne inteligence pridobimo konkurenčno prednost. Razumevanje primernosti teoretičnih pristopov s področja inteligentnih sistemov za reševanje praktičnih primerov v poslovnem okolju.

Prenosljive spretnosti - niso vezane le na en

predmet: Veščine skriptnega programiranja. Odkrivanje znanj iz podatkov. Kognitivni aspekti odločanja.

Intended learning outcomes:

Knowledge and understanding:

Having the theoretical and methodological knowledge from the field of computer reliability and performance. Understanding the importance of both disciplines. Knowing the practical values of both disciplines.

Application:

Application of methodological knowledge in design and support of various computer systems.

Reflection:

Understanding the relations among theoretical knowledge and methodologies and practical problems from the field of reliability and performance of computer systems.

Transferable skills – are not bound only to this course:

Students gain a new perspective as designers or supports of a computer system (application). This perspective opens new viewpoints such as critical analysis, synthesis, team work and social skills.

Metode poučevanja in učenja:

Predavanja bodo potekala ustno, vaje v obliki projektne dela na konkretnih aplikativnih zgledih.

Learning and teaching methods:

Lectures and oral presentations of the subject. Seminal work on real-life examples and problems.

Načini ocenjevanja:

Delež (v %) /

Weight (in %)

Assessment:

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

Sprotno preverjanje (domače naloge, kolokviji in projektno delo)

Končno preverjanje (pisni in ustni izpit)

Ocene: 6-10 pozitivno, 1-5 negativno

(v skladu s Statutom UL)

50%

50%

Homeworks.

Written exam.

Grading: 6-10 pass, 1-5 fail.

Reference nosilca / Lecturer's references:

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