

Faculty of Science and Mathematics / COMPUTER SCIENCE / DISTRIBUTED COMPUTER SYSTEMS

Course:	DISTRIBUTED COMPUTER SYSTEMS			
Course ID	Course status	Semester	ECTS credits	Lessons (Lessons+Exercises+Laboratory)
1359	Mandatory	6	4	2+1+0
Programs	COMPUTER SCIENCE			
Prerequisites	No prerequisites required.			
Aims	Through this course, students gain basic knowledge about: the hardware and software structure of distributed and parallel computer systems, the basics of parallel programming and algorithms for execution of competitive programs.			
Learning outcomes	On successful completion of this course students should be able to: 1. Understand the concept and importance of distributed computer systems. 2. Understand advanced architectures of parallel (multiprocessor) computer systems. 3. Define the concept of high performance computer system. 4. Use methods for performance evaluation of parallel and distributed computer systems. 5. Analyze the advantages and disadvantages of specific parallel computing system architecture. 6. Know basic parallel programming methods, their advantages and disadvantages. 7. Understand the rules and algorithms for competitive program execution, precisely the competitive process. 8. Are familiar with the distributed computer systems development trends.			
Lecturer / Teaching assistant	Prof. Dr. Stevan Šćepanović - teacher, MSc. Ivana Vukotić - assistant			
Methodology	Lectures, exercises in computer classroom / lab. Learning and individual work on practical assignments. Consultations.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Introduction. Basic concepts. Properties of high-performance computers.			
I week exercises	Examples and practical assignments.			
II week lectures	Classification and history of parallel and distributed systems. Software concept of distributed systems.			
II week exercises	Examples and practical assignments.			
III week lectures	Performances of parallel and distributed computer systems. Basic principles of distributed system design. Further development of super computers.			
III week exercises	Examples and practical assignments.			
IV week lectures	The basics of parallel programming. Task and data parallelism.			
IV week exercises	Examples and practical assignments. Homework.			
V week lectures	Client / server technology. Three-layered P-A-D model of data processing.			
V week exercises	Examples and practical assignments.			
VI week lectures	Cloud Computing.			
VI week exercises	Examples and practical assignments.			
VII week lectures	First test.			
VII week exercises	Examples and practical assignments.			
VIII week lectures	Processes and threads. Communication and synchronization of concurrent processes. Time synchronization in distributed systems.			
VIII week exercises	Examples and practical assignments.			
IX week lectures	Algorithms for mutual exclusion of critical intervals.			
IX week exercises	Examples and practical assignments.			
X week lectures	Defining the state of a distributed system. Coordination of distributed processes.			
X week exercises	Examples and practical assignments.			
XI week lectures	Distributed shared memory.			
XI week exercises	Examples and practical assignments.			

XII week lectures	Distributed file system.					
XII week exercises	Examples and practical assignments. Homework.					
XIII week lectures	File duplication (multiplication).					
XIII week exercises	Examples and practical assignments.					
XIV week lectures	Second test.					
XIV week exercises	Consultations. Examples and practical assignments.					
XV week lectures	Correction of first or second test.					
XV week exercises	Consultations.					
Student workload	4 credits x 30 hours = 120 hours					
Per week			Per semester			
4 credits x 40/30=5 hours and 20 minuts 2 sat(a) theoretical classes 0 sat(a) practical classes 1 excercises 2 hour(s) i 20 minuts of independent work, including consultations			Classes and final exam: 5 hour(s) i 20 minuts x 16 =85 hour(s) i 20 minuts Necessary preparation before the beginning of the semester (administration, registration, certification): 5 hour(s) i 20 minuts x 2 =10 hour(s) i 40 minuts Total workload for the subject: 4 x 30=120 hour(s) Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) 24 hour(s) i 0 minuts Workload structure: 85 hour(s) i 20 minuts (cources), 10 hour(s) i 40 minuts (preparation), 24 hour(s) i 0 minuts (additional work)			
Student obligations			Lessons attendance is mandatory for students, as well as doing home exercises, all tests and laboratory exercises.			
Consultations			Every week.			
Literature			1. A. S. Tanenbaum, M. van Steen - "Distributed Systems – Principles and paradigms", Prentice-Hall, Inc., New Jersey, 2002. 2. A. S. Tanenbaum, - "Distributed Operating Systems", Prentice-Hall, Inc., New Jersey, 1995. 3. G. Coulouris, J. Dollimore, T. Kin			
Examination methods			Homework assignments are evaluated with a total of 4 points. Two tests are evaluated with a total of 66 points. Final exam 30 points. Student gets the passing grade by collecting 50 points at least.			
Special remarks						
Comment						
Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points