

Specification for the book of courses

Study program		Electrical Engineering and Computer Science		
Module		Computing and Informatics		
Type and level of studies		Undergraduate Academic Studies		
The name of the course		Computer Architecture and Organization II		
Lecturer (for lectures)		Milovanović I. Emina, Milentijević Z. Ivan, Ćirić M. Vladimir		
Lecturer/associate (for exercises)		Milenković M. Aleksandar, Stojnev Ilić I. Aleksandra, Simić S. Vladimir, Vojinović M. Oliver		
Lecturer/associate (for OFE)		Milenković M. Aleksandar, Stojnev Ilić I. Aleksandra, Simić S. Vladimir, Vojinović M. Oliver		
Number of ECTS	6	Course status (obligatory/elective)	Obligatory	
Prerequisites	Computer architecture and organization I			
Course	Mastering memory hierarchy, computer arithmetics, control unit design, pipelining.			
Course outcomes	Deep understanding of memory hierarchy, arithmetic-logic unit, basic instruction pipelining.			
Course outline				
Theoretical teaching	Memory hierarchy. Cache memory. Main memory. Virtual memory. Discs. Computer arithmetics. Integer addition/subtraction, multiplication and division. Floating point addition, multiplication, division. Rounding errors. Control unit design. Hardware CU. Microprogrammed CU. CISC vs RISC. Instruction pipelining. Pipelining hazards. Overcomming data hazards. Scoreboard. Tomasulo algorithm. Overcomming control hazards. Delayed branh. Dynamic branch prediction. Speculation. Extending instruction pipeline for floating point operations.			
Practical teaching (exercises, OFE, study and research)	Oral and laboratory exercises including programming tasks that exemplify problem statements examined in the course.			
Textbooks/references				
1	W. Stallings, Organizacija i arhitektura računara, prevod 9. izdanja, CET, Beograd, 2013			
2	D. Patterson and J. Hennessy, Computer organization and design: The Hardware/Software Interface, 5th Edition, MK, 2013.			
3	N. Milenkovic, Computer architecture and organization, Faculty of Electronic Engineering, Nis, 2004 (in Serbian)			
4				
5				
Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
2	2	1	0	0
Teaching methods	Lectures, oral and Lab exercises			
Grade (maximum number of points 100)				
Pre-exam duties	Points	Final exam		Points
Activity during lectures	5	Written exam		
Exercises	20	Oral exam		45
Colloquia	30			
Projects				