

Specification for the book of courses

Study program		Electrical Engineering and Computer Science		
Module		Common		
Type and level of studies		Doctoral studies		
The name of the course		Digital Systems		
Lecturer (for lectures)		Đorđević Lj. Goran		
Lecturer/associate (for exercises)				
Lecturer/associate (for OFE)				
Number of ECTS	10	Course status (obligatory/elective)	Elective	
Prerequisites				
Course objectives	The goal of the course is to expand and upgrade the knowledge gained in the field of digital system design and the adoption of new design methodologies and techniques needed for the design, analysis and implementation of complex digital high performance systems.			
Course outcomes	The learning outcome of the course is students' ability to use modern methods and design techniques, with the support of appropriate software tools in order to: a) design, analyze and realize digital systems of different levels of complexity, and b) explore alternative solutions in order to find the optimal compromise between hardware complexity, performance and consumption.			
Course outline				
Theoretical teaching	Characteristics of modern digital systems. Advanced technologies for realization of combinational and sequential digital circuits. Low-voltage and low power consumption digital systems. Asynchronous digital systems. Methodologies for designing complex digital systems at different levels of abstraction: RTL design and high level synthesis. Synthesis of the data path and control unit. Techniques for improving the performance of digital systems: pipeline and parallel architectures. Principles of hardware realization of arithmetic functions and DSP algorithms. Architecture of programmable digital circuits. Fault tolerant digital systems.			
Practical teaching (exercises, OFE, study and research)				
Textbooks/references				
1	D. Gajski, Principles of Digital Design, Prentice-Hall, Inc. Upper Saddle River, NJ, 1997.			
2	N.H E. Weste, D. M. Harris, CMOS VLSI Design - A Circuits and Systems Perspective, 4th Edition, Addison Wesley, 2010			
3	E.C. Ifeachor, B. W. Jarvis, Digital Signal Processing: A practical approach, Pearson Education, PHI/ 2002			
4				
5				
Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
3	0	0	0	0
Teaching methods	Lectures, seminars, assignments, and class discussions. Independent and team work of students in solving research-oriented tasks.			
Grade (maximum number of points 100)				
Pre-exam duties	Points	Final exam	Points	
Activity during lectures		Written exam		
Exercises		Oral exam	50	
Colloquia				
Projects	50			