

Specification for the book of courses

Study program		Computing and Informatics		
Module		Information Systems and Technologies		
Type and level of studies		Master studies		
The name of the course		Spectral Techniques		
Lecturer (for lectures)		Radmanović M. Miloš		
Lecturer/associate (for exercises)		Radmanović M. Miloš		
Lecturer/associate (for OFE)				
Number of ECTS	4	Course status (obligatory/elective)	Elective	
Prerequisites				
Course objectives				
The main objective of the course is to provide students with theoretical and practical knowledge in the field of application of spectral techniques in the design, analysis and implementation of digital systems.				
Course outcomes				
Students will be introduced to various methods of representation of discrete functions, techniques and methods for calculating the discrete transform and some applications of spectral techniques in the analysis and implementation of digital systems.				
Course outline				
Theoretical teaching				
Walsh, Haar, arithmetic transform, Reed-Muller transform for binary-valued functions and Vilenkin-Chrestenson transform, generalized Haar, and other related transforms for multiple-valued functions. Polynomial expressions and decision diagram representations for switching and multiple-value functions. Spectral analysis of Boolean functions. Spectral synthesis and optimization of combinational and sequential devices. Spectral methods in analysis and synthesis of reliable devices. Spectral techniques for testing computer hardware				
Practical teaching (exercises, OFE, study and research)				
Work with specialized software packages and tools. Program implementation of the algorithms for calculation of digital transforms and its application.				
Textbooks/references				
1	M. Karpovsky, R. Stankovic, J. Astola, Spectral Logic and Its Applications for the Design of Digital Devices, John Wiley & Sons, 2008.			
2	Documents on Web site: http://cs.elfak.ni.ac.rs/nastava/			
3				
4				
5				
Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
2	1	0		
Teaching methods				
Presentations by use of slides, seminars, projects.				
Grade (maximum number of points 100)				
Pre-exam duties		Points	Final exam	Points
Activity during lectures			Written exam	
Exercises			Oral exam	40
Colloquia				
Projects		60		