

Specification for the book of courses

Study program		Electrical Engineering and Computer Science		
Module		Electron Devices and Microsystems		
Type and level of studies		Undergraduate Academic Studies		
The name of the course		Integrated Circuits Design		
Lecturer (for lectures)		Andrejević-Stošović V. Miona		
Lecturer/associate (for exercises)		Mirković D. Dejan		
Lecturer/associate (for OFE)		Mirković D. Dejan		
Number of ECTS	5	Course status (obligatory/elective)	Elective	
Prerequisites				
Course objectives	Adoption and systematization of knowledge necessary for full custom digital integrated circuits design and semicustom design based on standard cells.			
Course outcomes	Acquiring of competences to: choose an adequate design style, use CAD tools for designing a digital circuit using a standard cells library, create and characterize standard cell, work in LINUX/UNIX operating system, write reports and present results.			
Course outline				
Theoretical teaching	Design styles, criteria for choosing the right style. Standard and submicron CMOS process. Design rules. Power routing in integrated circuits. Enclosure types. Global placement. Design based on standard cells; libraries; data formats. HDL adjusted to synthesis. Synthesis; verification; layout, routing, post-layout verification, extraction of electrical parameters from the layout. Full-custom design. Dimensioning of components. Layout of a MOS transistor. Symbolic layout. Electric schemes; simulation; LVS check; extraction of parameters from the layout; characterization after implementation. Adding new cells to existing library. Preparation of project documentation, writing reports.			
Practical teaching (exercises, OFE, study and research)	Students improve their knowledge obtained in lectures by acquiring design skills using professional software packages for the design of integrated circuits: Cadence and Mentor Graphics.			
Textbooks/references				
1	Branko L. Dokić, Predrag M. Petković. Design and analysis of CMOS Digital Integrated Circuits, Akademska misao Beograd, 2017. (in Serbian)			
2	Jan M. Rabaey, Anantha P. Chandrakasan, and Borivoje Nikolic. Digital integrated circuits: a design perspective. Vol. 2. Englewood Cliffs: Prentice hall, 2002.			
3	Neil HE Weste and David Harris. CMOS VLSI design: a circuits and systems perspective. Pearson Education India, 2015.			
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	2	0	0
Teaching methods	Lectures, auditory exercises, practical exercises and examples, projects.			
Grade (maximum number of points 100)				
Pre-exam duties	Points	Final exam	Points	
Activity during lectures	10	Written exam	0	
Exercises	20	Oral exam	30	
Colloquia	0			
Projects	40			