

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		Electronic Circuits and Systems Design		
Lecturer (for lectures)		Petković M. Predrag		
Lecturer/associate (for exercises)				
Lecturer/associate (for OFE)				
Number of ECTS		10	Course status (obligatory/elective)	Elective
Prerequisites				
Course objectives		Adopting and systematizing knowledge about methods and styles for designing electronic circuits and systems. Adopting advanced knowledge related to tools for electronic circuits and systems design in nano CMOS technologies.		
Course outcomes		Acquiring competencies for optimal choice of design methods depending on specific requirements. A detailed insight into the automated design and data flow in design tools. Upon completion of this course, students will have at least one complete projected electronic circuit (from functional description to preparation of data necessary for production) using the Cadence (and/or) Synopsis design tools.		
Course outline				
Theoretical teaching		Electronic circuits and systems design styles. Domains of project description. Design flow phases. Automation of design. Data formats in design tools. Design based on predesigned structures, semi-custom design. Structural design. Automatic synthesis. Physical design. Advanced CMOS processes. Floor planning. Layout design. Placement. Routing. Structure of a transistor. Parasitic effects. Sources of noises and interference. Techniques for removing noise and disturbances from system to physical (layout) level. Packaging. Verification.		
Practical teaching (exercises, OFE, study and research)		Within the course students will design a specifically electronic integrated circuit (from functional description to preparation of data necessary for production) using the Cadence and Synopsis design tools.		
Textbooks/references				
1		V. Litovski, Projektovanje elektronskih kola, Nova Jugoslavija Vranje, 2000, ISBN 86-7369-015-3.		
2		Weste, N.H.E., Harris, D., CMOS VLSI Design A Circuit and Systems Perspective, Fourth edition, Addison-Weslwy, Pearson Education, Inc., 2010, ISBN 10: 0-321-54774-8.		
3		Dokić B., Petković P., Analysis and design of CMOS digital integrated circuits (in Serbian), Academic Mind, Belgrade, 2017, ISBN 978-86-7466-696-8		
4		Saint C., Saint J., IC Mask Design, Essential Layout Techniques, McGraw-Hill, 2002, ISBN 0-07-13899.		
5		Razavi, B., Design of Analog CMOS Integrated Circuits, Mc Graw Hill India; 2nd edition (July 1, 2017), ISBN-10: 938706784 Хи факултет Ниш, Фебруар 2010.		
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		Presentations, seminars, practical work		
Grade (maximum number of points 100)				
Pre-exam duties		Points	Final exam	Points
Activity during lectures			Written exam	
Exercises			Oral exam	30
Colloquia				
Projects		70		