

Study program:	Electrical and computer engineering – Module: Computer engineering,			
Type and level of studies:	Undergraduate academic studies (first level of studies)			
Course unit:	Digital systems design			
Teacher in charge:	Uroš Pešović, Vanja Luković			
Language of instruction:	English			
ECTS:	6			
Prerequisites:	-			
Semester:	Summer			
Course unit objective				
Familiarity with modern approaches to designing digital circuits and systems; familiarization with modern design methodologies based on ASIC (Application Specific Integrated Circuit) and SoC (System on Chip) principles; familiarization with hardware description languages (VHDL, SystemC); introduction to hardware modeling tools (ModelSim).				
Learning outcomes of Course unit				
The student can explain the design principles of modern digital circuits and systems; knows the methodology of designing digital circuits and systems; knows languages for describing hardware and can write models of simple digital systems using VHDL; can use tools to simulate digital circuit program models (ModelSim).				
Course unit contents				
<i>Theoretical classes</i>				
Introduction to digital systems design. Digital circuit technologies. Integration opportunities and future trends.				
Design techniques. ASIC and SoC design. Features of digital circuits. Switching characteristics. Delay, load factors. Logical structures. Combination and sequential networks.				
Design strategies. Separation of clock signals. Designing for small forces. Physical arrangement of the car.				
Subsystem design. Arithmetic blocks. Circuit Testing Techniques. Principles tested during fabrication. Design principles from the aspect of testing. Self-testing techniques.				
Design tools. Hardware description languages. VHDL. SystemC				
<i>Practical classes</i>				
Designing practical tasks using design tools. Circuit modeling using VHDL and SystemC languages.				
Literature:				
1.	Zwolinski Mark, "Digital System Design with VHDL", 2th Edition, PEARSON, Prentice Hall, 2004.			
2.				
3.				
4.				
5.				
Number of active teaching hours				
Lectures:	Practice:	Other forms of classes:	Other classes	Independent work:
2	1	0		Case study:
Teaching methods:				
Realization of lectures on the model of interactive teaching using the methods of practical work.				
Examination methods (maximum 100 points)				
Exam prerequisites	No. of points:	Final exam	No. of points:	
Student's activity during lectures	5	oral examination	20	
Practical classes	15	written examination	20	
Colloquiums	30			
Seminars/homework	10			
Grading system				
Grade	No. of points:		Description	
10	91-100		Excellent	
9	81-90		Exceptionally good	
8	71-80		Very good	
7	61-70		Good	
6	51-60		Passing	
5	less than 50		Failing	