

## Specification for the book of courses

<b>Study program</b>		Electrical Engineering and Computer Science		
<b>Module</b>		Electron Devices and Microsystems		
<b>Type and level of studies</b>		Undergraduate Academic Studies		
<b>The name of the course</b>		Digital Microelectronics		
<b>Lecturer (for lectures)</b>		Danković M. Danijel		
<b>Lecturer/associate (for exercises)</b>		Danković M. Danijel		
<b>Lecturer/associate (for OFE)</b>		Danković M. Danijel		
<b>Number of ECTS</b>	6	<b>Course status (obligatory/elective)</b>	Obligatory	
<b>Prerequisites</b>				
<b>Course</b> Introduction to basic digital microelectronic circuits and their practical implementation.				
<b>Course outcomes</b> Theoretical knowledge. Ability to use of digital circuit simulator. The ability to use digital circuits in practice.				
<b>Course outline</b>				
<b>Theoretical teaching</b>	Basic logic gates: gates technology - CMOS logic circuits, TTL logic. Combinational logic circuits: a universal logic elements, combining the functions of logic - adders, comparators, encoders and decoders, multiplexers and demultiplexeri. Bistable memory unit: latch, flip-flop, flip-flop types and implementation. Counters: asynchronous and synchronous counters, counter design, cascading counters. Shift registers: types of registers, shift registers as counters, other applications of shift registers. Memory: RAM, ROM, flash. D/A conversion.			
<b>Practical teaching (exercises, OFE, study and research)</b>	Computer simulation of circuits with digital microelectronic components. Selection of digital components on the basis of the technical specifications (datasheets). Practical implementation of digital circuits, on a breadboard level.			
<b>Textbooks/references</b>				
1	Thomas L. Floyd, „Digital Fundamentals“, 11th Edition, Pearson Education, 2015, ISBN 978-1-292-07598-3.			
2	William Kleitz, „Digital Electronics a Practical Approach with VHDL“, 9th Edition, Pearson Education, 2012, ISBN 978-0138146467.			
3	Andrew Rushton, „VHDL for Logic Synthesis“, 3rd Edition, A John Wiley and Sons, 2011, ISBN 978-4709787972.			
4	A. Anand Kumar, „Fundamentals of Digital Circuits“, 4th Edition, PHI Learning Private Limited, 2016, ISBN 978-81-203-5268-1.			
5	Интернет презентација предмета са предавањима и вежбањима ( <a href="http://mikro.elfak.ni.ac.rs/">http://mikro.elfak.ni.ac.rs/</a> )			
<b>Number of classes of active education per week during semester/trimester/year</b>				
<b>Lectures</b>	<b>Exercises</b>	<b>OFE</b>	<b>Study and research work</b>	<b>Other classes</b>
2	2	1	0	0
<b>Teaching methods</b>	Lectures; Computer simulations; Practical laboratory work; Consultation.			
<b>Grade (maximum number of points 100)</b>				
<b>Pre-exam duties</b>	<b>Points</b>	<b>Final exam</b>	<b>Points</b>	
<b>Activity during lectures</b>	20	<b>Written exam</b>	30	
<b>Exercises</b>	20	<b>Oral exam</b>	30	
<b>Colloquia</b>				
<b>Projects</b>				