

		Course title: <i>Automated design of microelectornics circuits and systems</i>		
Course code	Course status	Semester	Number of ECTS credits	Lecture hours
PA3305	Elective	III	5	3+0+ 1

Study program: Graduate academic studies, ELECTRICAL ENGINEERING, study program: Electronics, Telecommunications and Computer engineering (studies last for 4 semesters, 120 ECTS credits).	
Prerequisites: No prerequisites required.	
Course aims: <i>The students will be introduced in automated design of microelectronics circuits and systems, simulation, verification and configuration of real PCB (Printed circuit boards) or SoC (Systemon Chip) based sustems.</i>	
Teacher(s) first and last names: Ph.D.R. Stojanović	
Studying method: Lectures, exercises, laboratory exercises, individual work on practical tasks, main project, consultations, etc.	
Course synopsis:	
Preliminary week I week II week III week IV week V week VI week VII week VIII week IX week X week XI week XII week XIII week XIV week XV week XVI week Final week XVIII-XXI week	Preparation and semester enrolment. Introduction. The heed for automated design. Description og actual design techniques. BASics VHDL, components, paralel description, sequential description, structural description. Using of MaxPlus2-Quatrus-Xilinx programming packets for VHDL editing, compiling and simulations. Other integrated software for hardware description. Cadence, Verilog. System C. SPICE. PSPICE concept. Basics of ASIC design. "Flow-chart" ASIC design. Examples; Tanner, L-Edit Pro: Layout & Verification. T-Spice Pro Designer: Design & Simulation. Free week Design of complex electronic circuit (analog, digital, mixed) using automated design. FPGA design. Example of digital design. Design, Simulation. Verification. Configuration, Debuging. Example of analog design. Design, Simulation. Verification. Configuration, Debuging. Example of mixed design. Design, Simulation. Verification. Configuration, Debuging. Complex megafunctions – cores. »Study case I« »Study case II« Project work <i>Funal exam</i> Administrative procedures. Additional lessons, correction of the final exam and administrative procedures.
STUDENT WORKLOAD	
<u>per week</u>	<u>per semester</u>
Working hours: 5 credits x 40/30 = 6 hours and 40 min. Working hours structure: 2 hours for teaching 0 hour for exercises 2 hours for laboratory exercises 2 hours for individual work, including consultations.	Teaching and the final exam: (6hours,40 min) x 16 = 106hours 40 min. Necessary preparation (before semester): 2 x (6hours 40 min) = 13hours and 20 min. Total work hours for the course: 150hours Additional hours for preparing correction of the final exam, including the exam taking: up to 30hours. Work hours structure: 106hours and 40 min (lectures) + 13hours and 20 min(preparation) + 30hours (additional work)
Lessons attendance is mandatory for students, as well as doing home and laboratory exercises and both tests.	
Literature: [1] Chin-Hwa Lee, <i>Digital Design Using VHDL</i> , CorralTek, Salinas, California [2] Michael John Sebastian Smith, <i>Application-Specific Integrated Circuits</i> , Addison-Wesley, 1997. [3] R. Stojanovic, <i>Automatizovani Dizajn Elektronskih Kola (ADEK-CAED)</i> , Univerzitet Crne Gore, skripta, CD.	
The forms of knowledge testing and grading: - Home exercises carry 5 points. - Each test (seminar work) carries 20 points (40 points total). - Project work carries 45 points Student gets the passing grade by collecting 50 points at least.	
Special remarks for the course : If needed, the course can also be taught in English.	
Teacher(s) who provided the information: Ph.D. R. Stojanović	