

Study: Physics			
Type and level of studies: Bachelor studies			
<b>Course name: Fundamentals of Electronics</b>			
Lecturer: <b>Dragan Petković</b>			
Status: Compulsory			
ECTS: 7			
Attendance prerequisites: Electromagnetism 1, Electromagnetism 2			
<b>Course aims</b> Introduction to the physics of electronic circuit component functioning and the principles of operation of basic electronic circuits.			
<b>Course outcome</b> Understanding physical processes in semiconductors and semiconductor components, the functioning of basic semiconductor components and electronic circuits. Preparing for the practical application of the acquired knowledge: analysing complex solutions, selecting the most adequate solutions, exploring the professional literature.			
<b>Course content</b> <i>Theoretical Part</i> Semiconductors. Pure and doped semiconductors. The flow of current through semiconductors. Contact phenomena. PN junction. Real diode and semiconductor diode laser. Bipolar transistor. FET. MOSFET. Rectifier. Amplifier. Operational amplifier and applications. Oscillators. The transistor as a switch. Impulse electronics, multivibrators. Basic logic circuits. Combinational logic circuits. The elements with memory in circuits. Registers and shift registers. The counter. The fundamentals of analogue and digital systems connection. A/D and D/A conversion. Integrated circuits and microelectronics. <i>Practical Part</i> COMPUTATIONAL EXERCISES: computational exercises: semiconductors, components, basic circuits. PRACTICAL EXERCISES ON A COMPUTER: Experimental exercises: PN junction. Photodiode and LED. Static characteristics of a transistor joined with a common emitter. Static characteristics of a MOS FET. Rectifiers. Amplifiers. Operational amplifier. Oscillator. Impulse electronic circuits. Logic circuits.			
<b>Literature</b> 1. С. Ристић: Дискретне полупроводничке компоненте, Универзитет у Нишу, Ниш 1990. 2. С. Тешић, Д. Васиљевић: Основи електронике, Грађевинска књига, Београд 2000. 3. Д. Живковић, М. Поповић: Импулсна и дигитална електроника, Академска мисао, Београд 2004. 4. Д. Петковић: Полупроводничке компоненте, скрипта 5. Д. Петковић: Основна електронска кола, скрипта 6. Д. Петковић: Практикум лабораторијских вежби из електронике, скрипта			
<b>Number of active classes</b>			Other classes
Lectures: 3	Practical classes: 1	Laboratory exercises: 2	
<b>Teaching methods</b> Lectures (3 classes per week during the semester), calculation exercises (1 classes per week during the semester), laboratory exercises (2 classes per week during the semester).			
<b>Assessment (maximum 100 points)</b>			
<b>Course assignments</b>	<b>points</b>	<b>Final exam</b>	<b>points</b>
Lectures	10	written exam	20
Two term paper	10	oral exam	40
Laboratory exercises	20	.....	
Total	40		60
Two term tests which include theoretical questions and computational problems: 2x30=60 points			
Note: By passing both term tests (50% for both theory-related questions and computational problems) the student may obtain a grade before the official exam.			