

NAZIV PREDMETA		Fundamentals of electronics I				
Code	PMT058	Year of study	3.			
Course teacher	Siniša Antonijević	Credits (ECTS)	5			
Associate teachers		Type of instruction (number of hours)	P	S	V	T
			45	0		
Status of the course	mandatory	Percentage of application of e-learning				
OPIS PREDMETA						
Course objectives	Acquiring basic knowledge on construction and properties of basic electronic elements .					
Course enrolment requirements and entry competences required for the course	Course enrolment requirements: none Entry competences: basic understanding of electric charge and electric field concept, Kirchhoffs i Ohms law.					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>Students are expected to be able to:</p> <ol style="list-style-type: none"> 1. Categorize types of semiconductors 2. Explain the basic properties of semiconductors 3. Explain the PN-junction forming process 4. Explain the properties of the rectifying semiconductor and vacuum diode 5. Explain the half-wave rectifier basic principle of operation 6. Classify the basic types of semiconductor diodes 7. Qualitatively describe construction and operation principle of BJT 8. Qualitatively describe construction and operation principle of JFET 9. Qualitatively describe construction and operation principle of MOSFET 					
Course content broken down in detail by weekly class schedule (syllabus)	<ol style="list-style-type: none"> 1. Introduction to the course. Presentation of necessary requirements, grading criteria, and exam format. Properties of conductors and semiconductors. Energy bands. Fermi-Dirac distribution. 2. Energy bands in semiconductors. Intrinsic semiconductors, impurities in semiconductors and extrinsic semiconductors. 3. Generation, recombination, mass action law, carrier concentrations. 4. Carrier mobility, semiconductor conductivity. Drift and diffuse current. 5. Colloquium 1. Formation of PN junction. 6. PN junction. Semiconductor diode. Half-wave rectifier. 7. Voltage-current curve of semiconductor diode. Breakdown. Operating point. 8. Load line, analysis of diode and resistor connected in series. 9. Diode capacitances, diode equivalent circuit. 10. Dissipated diode power. Types of semiconductor diodes – overview. Vacuum diode. 11. Colloquium 2. Triode vacuum tube, transistors in general. 12. Bipolar junction transistor (BJT). 13. Junction field effect transistor (JFET) 14. Metal-oxide-semiconductor field effect transistor (MOSFET) 15. Colloquium 3. 					

Format of instruction	Lectures, seminars, consultations.
Student responsibilities	Minimum 70% class attendance.
Screening student work (<i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i>)	5 ECTS credits are distributed as follows: <ul style="list-style-type: none"> - 45 hours of lectures – 1,5 ECTS credit - 105 hours of independent study for colloquiums and exam – 3,5 ECTS credits
Grading and evaluating student work in class and at the final exam	<p>Student will have successfully completed the course if he/she</p> <ul style="list-style-type: none"> a) achieves minimum 50% result at written exam, or b) achieves minimum 50% result for each optional colloquium <p>In case only 1 of 3 optional colloquiums is not positive (less than 50% result), student will have an option for exam questions to be limited to chapters pertaining to this colloquium only.</p> <p>The student class activity is rewarded with "+". Each "+" will be cumulatively added as +1% on each subsequent colloquium result.</p> <p>The grade by percentages:</p> <ul style="list-style-type: none"> 50% to 61% - 2 62% to 74% - 3 75% to 87% - 4 88% to 100% - 5
Required literature (available in the library and via other media)	<ul style="list-style-type: none"> - lecture notes (presentations available online) - V. Papić, Predavanja iz osnova elektronike, Sveučilišna skripta, 2005.
Optional literature (at the time of submission of study programme proposal)	<ul style="list-style-type: none"> - B. Jajac, Teorijske osnove elektrotehnike: Struktura materije i mjerne jedinice, elektrostatika, Graphis, Zagreb , 2001 - B. Juzbašić, Elektronički elementi, Školska knjiga, Zagreb, 1984.
Quality assurance methods that ensure the acquisition of exit competences	<ul style="list-style-type: none"> - communication with students - anonymous questionnaire - percentage of students that successfully complete course - self-analysis

Other (as the proposer wishes to add)	
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