

NAZIV PREDMETA		Basics of electrical engineering and electronics				
Code	PMT081	Year of study	1			
Course teacher	Siniša Antonijević	Credits (ECTS)	6			
Associate teachers	Hrvoje Turić	Type of instruction (number of hours)	P	S	V	T
			30		30	
Status of the course	mandatory	Percentage of application of e-learning				
OPIS PREDMETA						
Course objectives	Acquiring basic knowledge of electrical engineering and electronics.					
Course enrolment requirements and entry competences required for the course	Course enrolment requirements: none Entry competences: none					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Explain the physical nature of current, voltage and resistance 2. Analyze basic passive electrical circuits in DC conditions 3. Describe the role of semiconductors in electronics 4. Explain the principle of operation of simple transistor amplifier 5. Explain the principle of operation of transistor switch 6. Classify logic gates 7. Explain the realization of logical gates using transistors 8. Classify basic types of bistable multivibrators 					
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. Electric charge, electric field. 2. Electric field, electric potential. 3. Voltage, current, resistance. Ohms law. Electrical energy and power. 4. Electric circuits in general, representation via schematics. 5. Real and ideal current and voltage sources. DC and AC sources. Kirchhoff laws. Serial connection of voltage sources. 6. Colloquium 1. Semiconductors. 7. PN junction. Semiconductor diodes – half wave rectifier, V-I curve. 8. Bipolar junction transistors (BJTs). 9. Field effect transistors (FETs). 10. Amplifiers in general. Simple transistor amplifier example. 11. Colloquium 2. Digital electronics overview. Basic logic gates. Adder. 12. Transistor switch. Logic families. CMOS logic examples. 13. Sequential logic overview. Level triggered bistables. 14. Edge triggered bistables. 15. Colloquium 3. 					
Format of instruction	Lectures, exercises, 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>)	6 ECTS credits are distributed as follows: <ul style="list-style-type: none"> - 30 hours of lectures – 1 ECTS credit - 30 hours of exercises – 1 ECTS credit - 120 hours of independent study for colloquiums and exam – 4 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> <p>a) achieves minimum 50% result at written exam, or</p> <p>b) achieves minimum 50% result at each optional colloquium</p> <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> <p>50% to 61% - 2 62% to 74% - 3 75% to 87% - 4 88% to 100% - 5</p>
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. - P. Biljanović, Elektronički sklopovi, Školska knjiga, Zagreb, 1989. - N. Storey, Electronics: A Systems Approach, Prentice Hall, 1998. - P. Slapničar, Gotovac, Elektronički sklopovi, Sveučilište u Splitu, 2000.
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)	