

COURSE DESCRIPTION CARD										
Faculty of Electrical Engineering										
Field of study	Electrical and Electronics Engineering							Degree level and programme type	bachelor's degree	
Specialization/ diploma path								Study profile		
Course Name	Electrical Circuits 1							Course code	IS-FEE-10070W	
								Course type	elective	
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	winter	
	15	30	15		15			No. of ECTS credits	7	
Entry requirements										
Course objectives	To receive the abilities to perform a simple analysis of linear DC and AC circuits contain up to two sources. To use complex numbers to calculate currents, voltages and power. Received results have to be properly interpreted and verified. Student discuss problems by using good terminology.									
Course content	Element Constrains. Current and equivalent voltage on basic elements. Basic circuit analysis. Node-Voltage and Loop-Current Analysis. Thevenin equivalent circuits. Power of load and source. Analysis of resistive circuits with OA. Sinusoids and phasors. Phasor diagrams for simple circuits. Circuits analysis with phasors. Energy and power. Compensation of reactive power. The frequency analysis of RL, RC and RLC circuits. Simulation software for choosen applications. Interpretation of results.									
Teaching methods	problem based learning, self-work, discussions, experiments									
Assesment methods	Problems are presented for students at the beginning of semester. The evaluation is performing during personal discussion on several problems concerning all indicated topics.									
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study		
LO1	uses the proper concepts from the electrical circuits domain									
LO2	describes the electrical features, dependences and parameters of basic elements of electric circuits									
LO3	defines and describes the dependences in resonant circuits									
LO4	calculates the currents, voltages and powers in DC and AC circuits also with the use of complex numbers									
LO5	applies the simulations to analyse of DC and AC circuits									
Symbol of learning outcome	Methods of assessing the learning outcomes							Type of tuition during which the outcome is assessed		
LO1	evaluating the student's solutions of presented problems							L, C, LC		
LO2	evaluating the student's solutions of presented problems							L, C		
LO3	evaluating the student's solutions of presented problems, personal assessment							L, LC		
LO4	evaluating the student's solutions of presented problems, personal assessment							C, L, SW		
LO5	evaluating the student's solutions of presented problems, personal assessment							C, LC, SW		

Student workload (in hours)		No. of hours	
Calculation	lecture attendance	15	
	attending the class sessions	30	
	attending and providing the laboratory class experiments and simulation at workshop	30	
	self and team -working on learning and preparing the problems solutions	60	
	preparation for and participation in exams/tests	25	
	participation in student-teacher sessions related to the classes and lecture	15	
	TOTAL:	175	
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		90	3
Student workload - practical activities		160	6
Basic references	<ol style="list-style-type: none"> 1. Thomas R. E., Rosa A. J., Toussaint G. J.: The Analysis & Design of Linear Circuits. 6th ed, John Wiley & Sons Inc. 2009. 2. Tung L. J., Kwan B. W.: Circuit Analysis. World Scientific 2001. 3. Irvin J. D., Nelms R. M.: Basic Engineering Circuits Analysis. International Student Version. John Willey & Sons Inc. 2008. 4. https://www.electrical4u.com/electrical-engineering-articles/circuit-theory/ 5. https://www.khanacademy.org/science/electrical-engineering 		
Supplementary references			
Organisational unit conducting the course	Department of Electrotechnics, Power Electronics and Power Engineering	Date of issuing the programme	
Author of the programme	Jaroslaw Makal, Ph.D. Eng.	03.02.2023	