

## COURSE DESCRIPTION CARD

Faculty of Electrical Engineering									
Field of study	Electrical and electronic engineering							Degree level and programme type	Bachelor's degree
Specialization/ diploma path								Study profile	
Course name	Electrical Circuits 2							Course code	IS-FEE-10085S
								Course type	elective
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	summer
	15	30	15		15			No. of ECTS credits	6
Entry requirements	Electrical Circuits 1 or relevant								
Course objectives	To receive the abilities to perform an analysis of linear AC circuits with coupling elements, 3-phase systems and transient states. To provide experiments related to these topics and measure and calculate currents, voltages and powers. To use of good terminology in discussion on electrical problems. To use simulation for design and analysis of electrical circuits.								
Course content	Self inductance and mutual inductance. Analysis of circuits with magnetic coupling. Air transformer. Calculations and measurement of power in 3-phase systems. Balanced and unbalanced 3-phase circuits, Analysis of transient states in linear RC and RL circuits.								
Teaching methods	problem-based-learning, consultations, self-work, laboratory and simulation experiments								
Assessment method	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	<i>Student who has passed this course :</i>							Reference to the learning outcomes for the field of study	
LO1	uses the proper concepts for analysis of relevant topics from the electrical circuits domain								
LO2	classifies the 3-phase circuits and applies the proper methods for analysis								
LO3	provides experiments concerning the electric circuits with the use of proper instrumentation and confirm the results with simulations								
LO4	calculates the transient states in the circuits, makes the comments of expected results and presents them in								

	graphical forms		
LO5	uses the simulation software to analyse and design of an electrical circuit		
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, quizzes at lecture	L, C	
LO2	quizzes at lectures and final evaluation	L	
LO3	evaluating the student's solutions of presented problems, personal assessment on the base of partial evaluations	LC, SW	
LO4	evaluating the student's solutions of presented problems, personal assessment on the base of partial evaluations	C	
LO5	evaluation of the quality of report on designed project or analysed circuit with the use of simulation software	SW	
LO6			
Student workload (in hours)		No. of hours	
Calculation	lecture attendance	15	
	attending the class sessions	30	
	self-working on learning and preparing the problems solutions	39	
	preparation for and participation in exams/tests	25	
	attending the laboratory and workshop sessions	30	
	preparation for lab experiments and elaboration of reports	30	
	participation in student-teacher sessions related to the classes and lecture	10	
TOTAL:		170	
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		75	3
Student workload – practical activities		130	5
Basic references	1. Thomas R.E., Rosa A. J., Toussaint G.J.: The Analysis & Design of Linear Circuits. 6th ed, Wiley 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. <a href="https://www.khanacademy.org/science/electrical-engineering">https://www.khanacademy.org/science/electrical-engineering</a>		
Supplementary references	1. Michael E. Auer: Three Phase Circuits ( <a href="https://pl.scribd.com/document/248006055/1-Three-Phase-Circuits-pdf">https://pl.scribd.com/document/248006055/1-Three-Phase-Circuits-pdf</a> ); 2. <a href="https://www.youtube.com/watch?v=9wrAoE1fXCo">https://www.youtube.com/watch?v=9wrAoE1fXCo</a> ; 3. <a href="https://www.google.com/search?client=firefox-b&amp;q=micro+cap+manual">https://www.google.com/search?client=firefox-b&amp;q=micro+cap+manual</a> 4. <a href="https://www.google.com/search?client=firefox-b&amp;q=pspice+manual+9.1">https://www.google.com/search?client=firefox-b&amp;q=pspice+manual+9.1</a> ;		
Organisational unit conducting	Department of Electrotechnics, Power Electronics and	Date of issuing the programme	

<b>the course</b>	Power Engineering	
<b>Author of the programme</b>	Jaroslav Makal, Ph.D. Eng.	03.01.2023

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work,

S – seminar