Specification for the book of courses

Study program	Electrical Engineering and Computer Science		
Module	Electrical Power Engineering		
Type and level of studies	Undergraduate Academic Studies		
The name of the course	Electric Circuits in Power Engineering		
Lecturer (for lectures)	Javor L. Vesna		
Lecturer/associate (for exercises)	Javor L. Vesna		
Lecturer/associate (for OFE)			
Number of ECTS	6	**Course status (obligatory/elective)**	Obligatory
Prerequisites	No		
Course objectives	Mastering methods of analysis of electric circuits with lumped and distributed parameters for different types of excitation, in stationary and transient regime. Acquiring basic knowledge for the analysis of three-phase electric circuits. Introduction to matrix methods for analyzing electric circuits and computer programs for circuits' analysis.		
Course outcomes	Theoretical and practical knowledge of students in the field of electric circuits analysis. Ability of students to analyze electric circuits with lumped and distributed parameters, in stationary and transient regime, as well as for different types of excitation. Knowledge of matrix methods for analyzing electric circuits and corresponding computer programs.		
Course outline			
Theoretical teaching	Properties of electric circuits and their elements. Signals in electric circuits. Energy sources in electric circuits. Elements of electric circuits with multiple ports. Primary parameters of two-port networks (quadripoles). Connections of two-port networks. Secondary parameters of two-port networks. Special configurations of two-port networks. Frequency-domain analysis of electric circuits in the stationary regime. Natural frequencies of circuits, resonance and anti-resonance. Analysis of electric circuits in transient regime in time domain using differential equations and classical analysis. Laplace transformation. Inverse Laplace transformation. Electric circuits' analysis using Laplace transformation. Analysis of networks with distributed parameters. Power lines. Polyphase systems. Three-phase electric circuits. Analysis of three-phase electric circuits by symmetrical components method. Matrix methods in the analysis of electric circuits. Node-voltage method. Analysis of electric circuits using a computer.		
Practical teaching (exercises, OFE, study and research	Practical lectures are realized through computational exercises and problem solving, which covers the content of the theory of electric circuit analysis with the goal of acquiring functional knowledge.		
Textbooks/references			
1	Javor V., "Theory of electric circuits in power engineering," (in Serbian), Faculty of Electronic Engineering of Niš, 2015.		
2	Nilsson J. W., Riedel S. A., "Electric circuits," Prentice Hall, 2018.		
3	Reljin B., "Analysis of three-phase electric circuits," (in Serbian), Academic Mind, Belgrade, 2004.		
4	Milojković S., "Theory of electric circuits - collection of problems," (in Serbian), Sarajevo, 1991.		
5	Gmitrović M., Petković R., Tasić D., Cvetković Z., Mančić Ž., Milosavljević Z., Javor V., " Theory of electric circuits - methodical collection of problems," Ed. 2, (in Serbian), Faculty of Electronic Engineering of Niš, Niš, 1999.		

Number of classes of active education per week during semester/trimester/year				
Lectures	**Exercises**	**OFE**	**Study and research work**	**Other classes**
2	2	0	0	0
Teaching methods	Lectures, exercises and consultations.			

Grade (maximum number of points 100)			
Pre-exam duties	**Points**	**Final exam**	**Points**
Activity during lectures	10	**Written exam**	20
Exercises	10	**Oral exam**	20
Colloquia	40		
Projects			