

Specification for the book of courses

Study program		Electrical Engineering and Computer Science		
Module		Common		
Type and level of studies		Undergraduate Academic Studies		
The name of the course		Fundamentals of Theoretical Electrical Engineering 2		
Lecturer (for lectures)		Cvetković Ž. Zlata, Raičević B. Nebojša, Cvetković N. Nenad, Perić T. Mirjana, Vučković N. Ana		
Lecturer/associate (for exercises)		Perić T. Mirjana, Vučković N. Ana, Živaljević U. Dragana, Nikolić Z. Bojana, Jovanović B. Dejan, Jovanović B. Dragana		
Lecturer/associate (for OFE)		Perić T. Mirjana, Vučković N. Ana, Ilić S. Saša, Živaljević U. Dragana, Nikolić Z. Bojana, Jovanović B. Dejan, Jovanović B. Dragana		
Number of ECTS	7	Course status (obligatory/elective)	Obligatory	
Prerequisites				
Course objectives	The aim of the subject is to familiarize students with the basic laws of electromagnetism and train them to solve AC (alternating current) circuits.			
Course outcomes	Students who successfully adopt the course material will be capable of following other specialized courses. They will be able to analytically calculate the magnetic flux density and magnetic field strength of a system of conductors of different shapes, calculate the magnetic flux density of simple coil structures. Students can solve practical electromagnetic-field problems, learn techniques for efficient solution of complex a.c. circuits.			
Course outline				
Theoretical teaching	Electromagnetism (Stationary magnetic field. Magnetic flux density vector. Magnetic flux. Biot-Savart law. Ampère's law. Ferromagnetic materials. Boundary conditions. Magnetic circuits. Electromagnetic induction. Faraday's law. Self and mutual inductances. Energy and losses in the magnetic field). Alternating currents circuits (Sinusoidal mode. Impedance. Phasors and complex representatives. Circuit solving in the complex domain. Complex power. Maximum power transfer theorem - impedance matching. Methods for circuit analysis. Theorems. AC bridges. Coupled circuits. Simple resonant circuits.			
Practical teaching (exercises, OFE, study and research)	During the practical lectures, numerical problems of electromagnetism and a.c. currents, covering areas from theoretical subject contents, are solved. Theoretical preparation for the experimental work in the laboratory. Familiarization with laboratory equipment and instruments. Familiarization with contents of experiments, basic theoretical backgrounds of the experiments, and pre-experimental considerations and calculations. Application of software FEMM 4.2 in Electromagnetics.			
Textbooks/references				
1	Dragutin N. Mitić, "Fundamentals of Electrical Engineering 2" (in Serbian), Petrograf, Niš, 2008.			
2	Everett M. Strong: "Electrical Engineering Basic Analysis", John Wiley and Sons, 1947.			
3	Dragutin N. Mitić, "Collection of problems for Fundamentals of electrical engineering 2" (in Serbian), Petrograf, Niš, 2008.			
4				
5				
Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
3	2	1	0	0
Teaching methods	Lectures and problem-solving classes, laboratory exercises, homeworks, consultations, e-learning.			
Grade (maximum number of points 100)				
Pre-exam duties	Points	Final exam		Points
Activity during lectures	10	Written exam		30
Exercises	10	Oral exam		30
Colloquia	20			
Projects				