

Specification for the book of courses

Study program	Communications and Information Technologies			
Module	Communications and Information Processing			
Type and level of studies	Master studies			
The name of the course	Computational Electromagnetics - Selected Chapters			
Lecturer (for lectures)	Cvetković Ž. Zlata, Raičević B. Nebojša			
Lecturer/associate (for exercises)	Nikolić Z. Bojana			
Lecturer/associate (for OFE)				
Number of ECTS	4	Course status (obligatory/elective)	Elective	
Prerequisites				
Course objectives	Providing the basic knowledge necessary to continue to actively participate in the development of new technologies, using numerical electromagnetics, that are of interest for the development of telecommunications.			
Course outcomes	Mastering the methodology of numerical solution of differential Maxwell equations in space and time, as well as the implementation of new features and components in the corresponding electromagnetic simulation environment.			
Course outline				
Theoretical teaching	Review of numerical methods for the calculation of the electromagnetic field. Finite difference time domain and the corresponding division of space. Numerical stability and dispersion of the finite difference time domain. Modeling of generators, the linear and nonlinear components and electronic assemblies. Absorbing conditions of the domain boundaries, with special emphasis on perfectly matched absorbing layer. Near-far transformation in time and frequency domain. Finite difference time domain variable spatial separation and numerical problems on the border of two domains. Development trends in the application of wireless and optical communication systems.			
Practical teaching (exercises, OFE, study and research)	The exercises are done on the computer from the most of the studied areas. Laboratory exercises are performed with own implemented simulation packages.			
Textbooks/references				
1	Stephen D. Gedney „Introduction to the Finite-Difference: Time-Domain (FDTD) Method for Electromagnetics“, Morgan & Claypool Publishers, 2011.			
2	H. Uhlmann (Ed.) et al, "Fundamentals of Modern Electromagnetics for Engineering -Textbook for Graduate Students, Part I: Static and Stationary Electrical and Magnetic Field", Technical University Ilmenau/Germany, 2005.			
3				
4				
5				
Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
2	1	0	0	0
Teaching methods	Lectures, auditory and laboratory exercises.			
Grade (maximum number of points 100)				
Pre-exam duties	Points	Final exam	Points	
Activity during lectures		Written exam		
Exercises	30	Oral exam	50	
Colloquia	20			
Projects				