Specification for the book of courses

Study program	Electrical Engineering and Computer Science		
Module	Electronics - Multimedia technologies		
Type and level of studies	Undergraduate Academic Studies		
The name of the course	Applied Electromagnetics		
Lecturer (for lectures)	Raičević B. Nebojša, Cvetković N. Nenad		
Lecturer/associate (for exercises)	Raičević B. Nebojša, Cvetković N. Nenad		
Lecturer/associate (for OFE)			
Number of ECTS	5	**Course status (obligatory/elective)**	Elective
Prerequisites	None		
Course objectives	The aim of the course is that students learn to use the most commonly applied methods for calculation of electromagnetic fields, and to become familiar with current regulations and standards in the field of electromagnetic reliability of electronic devices.		
Course outcomes	The student is trained to be able to solve basic engineering problems that require knowledge of electromagnetics and to understand the principles of operation of devices based on the properties of electromagnetic fields, which are of great importance in modern technologies.		
Course outline			
Theoretical teaching	Electric and magnetic field. Static and dynamic fields. Traveling waves. Sinusoidal waves in a lossless medium. Transmission Lines: Transmission line equations. Wave propagation on a transmission line. The lossless transmission line. Voltage reflection coefficient. Standing waves. Electrostatics: Maxwell's equations. Coulomb's law. Electric scalar potential. Poisson's equation. Dielectric boundary conditions. Image method. Magnetostatics: Magnetic forces and torques. The Biot—Savart law. Magnetic field due to surface and volume current distributions. Maxwell's magnetostatic equations. Gauss's law for magnetism. Ampere's law. Magnetic vector potential. Magnetic properties of materials. Magnetic permeability. Magnetic boundary conditions. Plane-Wave Propagation: Definition of plane wave. Dispersity equation. Polarization of plane wave. Phase and group velocity. Snell's laws. Fresnel refraction and diffraction coefficients. Bruster's angle. Metamaterials. Radiation and Antennas: The short dipole. Far-field approximation. Power density. Antenna radiation characteristics. Antenna pattern. Antenna directivity. Antenna gain. Radiation resistance. Electromagnetic Compatibility: Conductive and radiation interferences. Interferences caused by analogue and digital signals. Signal distortion. Screening. Grounding.		
Practical teaching (exercises, OFE, study and research	Simulation on a computer, using a software package for the calculation of the EM field, is provided.		
Textbooks/references			
1	F. T. Ulaby, E. Michielssen, U. Ravaioli: Fundamentals of Applied Electromagnetics (6/E), Prentice Hall, 2010.		
2	D. M. Veličković and others: The Electromagnetics Problem Solver (in Serbian), Faculty of Electronic Engineering, Niš, 2000.		
3	D. M. Veličković, F. H. Uhlmann, K. Brandisky, R. D. Stancheva, H. Brauer: Fundamentals of Modern Electromagnetics for Engineering, TU Ilmenau, Germany, 2005.		
4	J. V. Surutka: Electromagnetics (in Serbian), Građevinska knjiga, Beograd, 1966.		
5	D. M. Veličković: Electromagnetics - The first book (in Serbian), Faculty of Electronic Engineering, Niš, 2004.		

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	Besides board work, multimedial presentations, photographs and video clips are presented.			

Grade (maximum number of points 100)			
Pre-exam duties	**Points**	**Final exam**	**Points**
Activity during lectures	20	**Written exam**	30
Exercises		**Oral exam**	10
Colloquia			

Projects	40		