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	Electromagnetics		
Lecturer (for lectures)	Cvetković N. Nenad, Perić T. Mirjana		
Lecturer/associate (for exercises)	Jovanović B. Dejan		
Lecturer/associate (for OFE)			
Number of ECTS	6	**Course status (obligatory/elective)**	Obligatory
Prerequisites			
Course objectives	Enlarging existing and gaining new general and engineering knowledge in the field of electromagnetic field theory necessary for understanding and analysing different technical-technological processes in electric power systems, plants and devices.		
Course outcomes	To enable the student to recognize problems related to electromagnetic field theory and to formulate and solve simple problems that can occur in design, analysis or functioning of different elements of electric power systems, plants and devices.		
Course outline			
Theoretical teaching	Electromagnetic field. Integral and local form of Maxwell's equations. Electromagnetic properties of materials. Boundary conditions. Electromagnetic field potentials. Wave equation. Continuity equation. Electromagnetic problems classification in regards to time dependence. Poynting's theorem. Superposition principle. Quasi-stationary image theory in conducting and dielectric mirror. Electrodes systems and their parameters. Average potential method. Estimation method. Stationary current field. Image theory in finitely conducting mirror. Examples of grounding systems. Static electromagnetic field. Quasi-stationary image theory for a boundary surface between two media of different magnetic permeabilities, i.e. specific conductivities. Permanent magnet calculation. Electrostatic field energy. Quasi-stationary magnetic field energy. Neumann's formula, internal, external, dynamic and static inductance. Capacitance and inductance per unit length of the three-phase transmission line. Skin effect in conductors of circular cross-section.		
Practical teaching (exercises, OFE, study and research work)	Electromagnetic field. Integral and local form of Maxwell's equations. Electromagnetic properties of materials. Boundary conditions. Electromagnetic field potentials. Wave equation. Continuity equation. Electromagnetic problems classification in regards to time dependence. Poynting's theorem. Superposition principle. Quasi-stationary image theory in conducting and dielectric mirror. Electrodes systems and their parameters. Average potential method. Estimation method. Stationary current field. Image theory in finitely conducting mirror. Examples of grounding systems. Static electromagnetic field. Quasi-stationary image theory for a boundary surface between two media of different magnetic permeabilities, i.e. specific conductivities. Permanent magnet calculation. Electrostatic field energy. Quasi-stationary magnetic field energy. Neumann's formula, internal, external, dynamic and static inductance. Capacitance and inductance per unit length of the three-phase transmission line. Skin effect in conductors of circular cross-section.		
Textbooks/references			
1	D. M. Veličković, Electromagnetics - Book 1, First, second and third edition (1994, 1999, 2003), Faculty of Electronic enginering, Niš. [in Serbian]		
2	J. Surutka, Electromagnetics, Belgrade: Akademska misao, 2006. [in Serbian]		
3	B. Popović, Electromagnetics, Belgrade: Akademska misao, 2006. [in Serbian]		
4	D. M. Veličković et al., Collection of solved test problems from Electromagnetics-Part I, Faculty of Electronic enginering, Niš, 2000. [in Serbian]		
5	B. Popović, Proceedinggs of solved problems from electromagnetics, Belgrade: Građevinska knjiga, 1966. [in Serbian]		

Number of classes of active education per week during semester/trimester/year

Lectures	**Exercises**	**OFE**	**Study and research work**	**Other classes**
3	2	0	0	0

Teaching methods	Lectures and auditive practice classes. 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		**Written exam**	25
Exercises		**Oral exam**	25
Colloquia	50		

Projects			