

Specification for the book of courses

Study program		Electrical Engineering and Computer Science		
Module		Common		
Type and level of studies		Doctoral studies		
The name of the course		Electromagnetic Compatibility and Signal Integrity		
Lecturer (for lectures)		Dončov S. Nebojša		
Lecturer/associate (for exercises)				
Lecturer/associate (for OFE)				
Number of ECTS	10	Course status (obligatory/elective)	Elective	
Prerequisites				
Course objectives				
The acquisition of higher level theoretical and practical knowledge about the electromagnetic compatibility (EMC) problems and signal integrity and their solving on computer by using numerical techniques. Developing skills to conduct independent scientific-research work.				
Course outcomes				
Ability to independently solve practical problems of electromagnetic compatibility and signal integrity by using numerical modeling techniques. Ability to design complex integrated circuits that meet EMC standards.				
Course outline				
Theoretical teaching				
General EMC concepts and techniques. Sources of electromagnetic interference (EMI). EMI signal representation and characterization. The interference coupling mechanisms. Interference control techniques. Coupling of electromagnetic fields with multiconductor lines. Numerical simulation techniques (TLM, FDTD, FEM, MoM). Numerical simulation of the coupling between the integrated electronic systems. Principles of designing compact multifunctional integrated circuits (System in a Package - SiP and System on Chip - SoC). Multilayer printed circuit boards (PCBs) and multilayer printed wire boards (PWBs). Clock and power distribution.				
Practical teaching (exercises, OFE, study and research)				
Textbooks/references				
1	Christos Christopoulos, Principles and Techniques of Electromagnetic Compatibility, Second Edition, CRC Press, 2007.			
2	V.Prasad Kodali, Engineering Electromagnetic Compatibility: Principles, Measurements, Technologies and Computer Models, Wiley-IEEE Press, 2001.			
3	Dipak L.Sengupta, Valdis V. Liepa, Applied Electromagnetics and Electromagnetic Compatibility, John Wiley & Sons, 2001.			
4	Matthew N.O. Sadiku, Numerical Techniques in Electromagnetics, CRC Press, 2001.			
5	Antonije Đorđević, Dragan Olčan, Testing of electromagnetic compatibility (in Serbian), Academic mind, Belgrade, 2012.			
Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
3	0	0	0	0
Teaching methods				
Lectures, numerical simulations on computer, consultations, seminar paper, laboratory work.				
Grade (maximum number of points 100)				
Pre-exam duties		Points	Final exam	Points
Activity during lectures			Written exam	
Exercises			Oral exam	50
Colloquia				
Projects		50		