

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		Simulation of Industrial Systems		
Lecturer (for lectures)		Milojković T. Marko, Perić Lj. Staniša		
Lecturer/associate (for exercises)				
Lecturer/associate (for OFE)				
Number of ECTS	10	Course status (obligatory/elective)	Elective	
Prerequisites				
Modern trends of industrial development impose the growing need for simulation, especially where operations and tests on systems themselves are impractical, unprofitable or dangerous. Quality performed simulation requires both good mathematical basis and knowledge of industrial systems and related software.				
Course objectives				
Acquiring knowledge about the mathematical basis of quality simulation and obtaining adequate simulational models to solve practical problems in various areas of industry. Knowledge of appropriate software for the simulation as well as the current trends in the simulation of industrial systems.				
Course outcomes				
Acquiring knowledge about the mathematical basis of quality simulation and obtaining adequate simulational models to solve practical problems in various areas of industry. Knowledge of appropriate software for the simulation as well as the current trends in the simulation of industrial systems.				
Course outline				
Theoretical teaching				
The concept of simulation and methods. Design of simulation models. Simulation tools. The mathematical foundation of digital simulation. Numerical methods implemented in simulation tools. Simulation of systems with distributed parameters. Simulation of systems with discontinuities. Errors in the simulation and methods for overcoming them. The application of simulation in the identification, design and optimization of automatic control systems. Real-time simulation, hardware and software aspects, algorithms for numerical integration. Simulation of industrial systems. Simulation of complex systems. Modern trends in the simulation of industrial systems.				
Practical teaching (exercises, OFE, study and research)				
Textbooks/references				
1	D. Antić, B Danković, "Modelling and simulation of dynamical systems", Faculty of Electronic Engineering, Niš, 2001. (in Serbian)			
2	M. Milojković, D. Antić, S. Nikoli', "Practical handbook on modelling and simulation of dynamical systems", Faculty of Electronic Engineering, Niš, 2018. (in Serbian)			
3	H. Klee, "Simulation of Dynamic Systems with Matlab and Simulink", CRC Press, 2007.			
4				
5				
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				
Teaching methods (classical - lectures or mentor - consultations) will be adapted according to the number of students. By using scientific journals and other literature, the student deepens the material from lectures, and through the consultations and study research with the teacher student is trained to write his own scientific work. The student is required to do the project alone.				
Grade (maximum number of points 100)				
Pre-exam duties		Points	Final exam	
Activity during lectures			Written exam	
Exercises			Oral exam	
Colloquia			50	
Projects		50		