

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		System Identification		
Lecturer (for lectures)		Nikolić S. Saša		
Lecturer/associate (for exercises)				
Lecturer/associate (for OFE)				
Number of ECTS	10	Course status (obligatory/elective)	Elective	
Prerequisites				
Course objectives	Gain knowledge about modern system identification techniques, iterative identification methods and be familiar with a recent computer software tools for system identification.			
Course outcomes	Know how to use in practice modern computer systems and software tools for system identification as well as application of identification in adaptive control systems.			
Course outline				
Theoretical teaching	Plants classification. Identification algorithms and their convergence. Active identification. Gradient methods of identification. Single and multidimensional regression models. Nonlinear regression method. Iterative identification methods. Passive identification. Experiment planning. Forming of optimal identification algorithms. Theoretical background for Legendre, Laguerre, Chebyshev orthogonal polynomials. Design of almost and quasi orthogonal polynomials and their application in identification real dynamical systems. Application of orthogonal functions and filters in identification systems. Methods for assessing the quality of identification.			
Practical teaching (exercises, OFE, study and research)	Introduction to MATLAB System Identification Toolbox and its application in identification of a real dynamic system. Elaboration of the presented methodical units through project assignments.			
Textbooks/references				
1	B. Danković, D. Antić, Z. Jovanović, Identification systems (in Serbian), Faculty of electronic Engineering, Niš, 2010,			
2	L. Ljung, "System identifikation", Prentice Hill, New Jersey, 1997.			
3	P. Albertos, A. Sala, "Iterative Identification and Control", Springer, 2002.			
4	MATLAB 2018, System Identification Toolbox,			
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	Lectures or mentoring depending on the number of students. Students are encouraged to use scientific literature to deepen the knowledge from the lectures. Through research work and consultations with the professor, a student becomes able for writing a scientific paper on his own. A student is required to do a project assignment individually.			
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			