

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		Electrical Drives - Selected Chapters		
Lecturer (for lectures)		Mitrović N. Nebojša		
Lecturer/associate (for exercises)				
Lecturer/associate (for OFE)				
Number of ECTS		10	Course status (obligatory/elective)	Elective
Prerequisites				
Course objectives		Students are introduced to characteristic industrial applications of drives, methods of analysis, integration of necessary equipment, parameterization, commissioning and supervision.		
Course outcomes		Students are capable for independent analysis of operation in stationary and transient regimes, modelling of mechanical couplings, design of control algorithms and application of multi-motor drives.		
Course outline				
Theoretical teaching		Introduction. Electrical drive as a prime mover of an industrial process. Interfacing with a higher level control. Modelling of electrical drives. Control of electric drives. Power converter-motor-load systems. Multiquadrant operation. Parameter identification and estimation. Measurement of drive and process variables. AC motor drives. Coordinate transformation. Parameter estimation. Voltage and current fed converters. Induction motor drives. Scalar and vector control methods. Realization of modern control technique. Influence of parameters detuning. Sensorless operation. Synchronous motor drives. Control of synchronous machines. Scalar control. Vector control. Large power drives. Sensorless operation. AC machine of special construction and its applications in drives.		
Practical teaching (exercises, OFE, study and research)		Part of the course is conducted through individual research and study work in the field of electric motor drives. The study and research work are based on an active study of primary scientific sources, numerical simulations and organization and performance of experiments.		
Textbooks/references				
1		S .N. Vukosavic, "Digital Control of Electric Drives", Springer, 2007		
2		Piotr Wach, "Dynamics and Control of Electrical Drives", Springer, 2011		
3		B. Jeftenic, M. Bebić, S. Štatkić, "Multimotor electrical drives", Akademska misao, Belgrade 2011		
4		R. Krishnan, "Electric Motor Drives", Virginia Tech, Prantice Hall 2001		
5		P. C. Krause, O. Wasynczuk, ... "Analysis of Electric Machinery and Drive Systems", Willey 2013		
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 via the presentation of the necessary literature, tutorials and help in laboratory work. Study, research and independent work in the laboratory.			
Grade (maximum number of points 100)				
Pre-exam duties		Points	Final exam	Points
Activity during lectures			Written exam	
Exercises			Oral exam	40
Colloquia				
Projects		60		