

Specification for the book of courses

Study program		Electrical Engineering and Computer Science		
Module		Control Systems		
Type and level of studies		Undergraduate Academic Studies		
The name of the course		Servo Systems		
Lecturer (for lectures)		Mitić B. Darko, Veselić R. Boban		
Lecturer/associate (for exercises)		Milovanović B. Miroslav		
Lecturer/associate (for OFE)		Milovanović B. Miroslav		
Number of ECTS	5	Course status (obligatory/elective)	Elective	
Prerequisites				
Course objectives	Familiarize students with the tasks and principles of servo control, as well as with the ways of synthesis and realization of modern servo systems.			
Course outcomes	Gain theoretical and practical knowledge necessary for development of various servo system control structures, as well as their digital implementations by means of digital signal processor (DSP).			
Course outline				
Theoretical teaching	Notion and definition of a servo-system. Servo systems types and structures. Operating accuracy. Feedforward compensation. Disturbance estimation and compensation methods. Frequency domain servo system design using phase compensators and PID controllers. Digital implementation of control algorithms. Methods of numerical integration, Discrete equivalents of analogue filters and controllers. Realizations of digital controllers and filters. Digital signal processors (DSP) and their architecture. DSP peripherals intended for servo system realizations.			
Practical teaching (exercises, OFE, study and research)	Solving various problems in servo systems analysis and design through exercises. Introduction to TMS320F/C24xx DSP family specialized for control tasks. Design of a given positional or velocity servo system and its practical realization using MCK2407 system within the project for individual work.			
Textbooks/references				
1	Č. Milosavljević, Fundamentals of Automatic Control - Part I, Faculty of Electronic Engineering, Niš, 2002 (in Serbian).			
2	M. Stojić, Continuous-time Automatic Control Systems, Nauka, Beograd, 1996 (in Serbian).			
3	G.W. Younkin, Industrial Servo Control Systems - Fundamentals and Applications, Marcel Dekker Inc., 2002.			
4	TMS320F243/F241/C242 DSP Controllers Reference Guide - System and Peripherals, Texas Instruments, 2000.			
5	MSK2407 & MCK2407, TMS320LF2407 Motion Starter Kits & Motion Control Kits – User Manual, DSP Motion Solutions, Technosoft, 2001			
Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
2	2	1	0	0
Teaching methods	Lectures; Auditory and laboratory exercises; Consultations. Every student is required to do an individual project assignment.			
Grade (maximum number of points 100)				
Pre-exam duties	Points	Final exam		Points
Activity during lectures	10	Written exam		20
Exercises	25	Oral exam		20
Colloquia				
Projects	25			