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	Variable Structure Systems		
Lecturer (for lectures)	Antić S. Dragan, Mitić B. Darko		
Lecturer/associate (for exercises)			
Lecturer/associate (for OFE)			
Number of ECTS	10	**Course status (obligatory/elective)**	Elective
Prerequisites			
Course objectives	Gaining knowledge of the variable structure control systems with sliding mode and their application in the control of continuous- and discrete-time systems.		
Course outcomes	Knowledge of the methods for the implementation of variable structure control systems and their application in industrial processes.		
Course outline			
Theoretical teaching	The concept of variable structure systems and sliding mode. Continuous- and discrete-time sliding modes. Quasi sliding modes. Characteristics of systems with sliding mode control. Invariance conditions. Problems of mathematical description of sliding mode. Filippov's method. Equivalent control method. Stability of the systems with the sliding mode control. Systems with scalar and vector control. Methods for realization of sliding mode control in multivariable systems. Chattering reduction. Problems of realization of systems with sliding mode control. Sliding mode control in systems with finite zeros. Realization of sliding mode control based only on measuring of plant inputs and outputs. Examples of practical implementation of sliding mode control.		
Practical teaching (exercises, OFE, study and research			
Textbooks/references			
1	V.Utkin, J.Guldner, J.Shi, “Sliding Mode Control in Electromechanical System”, CRC Press, 1999.		
2	W. Perruquetti, J. P. Barbot, “Sliding mode control in engineering”, Marcel Dekker, 2002.		
3			
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	Lectures/consultations (in accordance with the number of students); study research work (review of the literature, analysis of problems, finding solutions, writing and presentation of individual 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		