

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		Advanced Techniques for Modeling of Dynamical Systems		
Lecturer (for lectures)		Mitić B. Darko		
Lecturer/associate (for exercises)		Sibinović D. Vladimir		
Lecturer/associate (for OFE)		Sibinović D. Vladimir		
Number of ECTS	6	Course status (obligatory/elective)	Elective	
Prerequisites				
Course objectives				
Training students to apply an indirect approach in modeling, based on the use of energy attributes of dynamical systems, to form mathematical models of different systems from technology and life. Introduction to the basics of system modeling with discrete events.				
Course outcomes				
Knowledge and application of formal algorithms in modeling of different dynamical systems, as well as systems with discrete events.				
Course outline				
Theoretical teaching				
Modeling of physical systems. Variation methods and energy functions. Variation principle for statics. Variation principle for dynamics. Hamilton's principle and Lagrange-Euler equations for mechanical, electrical and electromechanical systems. Incremental electromechanical converter models. Application of Lagrange-Euler equations in the modeling of electric machines. Introduction to system modeling with discrete events.				
Practical teaching (exercises, OFE, study and research)				
Practical classes follows teaching units of lectures with tasks that demonstrate the application of formal modeling methods on specific technical systems.				
Textbooks/references				
1	A. Salihbegović, Modelling of dynamical systems, Svetlost, Sarajevo, 1985 (in Serbian-Croatian)			
2	C. G. Cassandras and S. Lafortune, Introduction to Discrete Event Systems, Springer Science + Business Media, 2008.			
3				
4				
5				
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 exercises; Computer exercises; Consultations.				
Grade (maximum number of points 100)				
Pre-exam duties		Points	Final exam	Points
Activity during lectures			Written exam	20
Exercises			Oral exam	20
Colloquia		60		
Projects				