Specification for the book of courses

Study program	Electrical Engineering and Computer Science		
Module	Electrical Power Engineering		
Type and level of studies	Undergraduate Academic Studies		
The name of the course	Automatic Control		
Lecturer (for lectures)	Mitić B. Darko, Perić Lj. Staniša		
Lecturer/associate (for exercises)	Danković B. Nikola, Mitić B. Darko		
Lecturer/associate (for OFE)	Danković B. Nikola, Perić Lj. Staniša		
Number of ECTS	6	**Course status (obligatory/elective)**	Obligatory
Prerequisites			
Course objectives	Introduction to the basic idea of automatic control, components of control systems, systems modeling, as well as control systems analysis and design.		
Course outcomes	Systematic approach to modeling of automatic control systems. Structural block diagram algebra. Characteristic transfer functions derivations. System analysis in time, frequency and complex domain. Controller design and tuning. Practical implementations of automatic control systems in industry. Introduction to software tools.		
Course outline			
Theoretical teaching	Overview of the automatic control systems (ACSs) development.. ACSs classification. Modeling of linear analog and digital ACSs. ACS structure. Structural block diagrams of control systems, Linear systems analysis in time, frequency and complex domain. System stability. Stability analysis methods in frequency and complex domains. System performance rating and design criteria. Continuous-time ACSs synthesis. Industrial controllers. PID controller design. Examples of modern ACSs architectures and implementations.		
Practical teaching (exercises, OFE, study and research work)	The Laplace transformation, definition, properties and applications. Signal flow graph and Mason's rule in structural block diagram analysis. Electromechanical analogies and electrical circuits transfer functions derivation. State space approach. State space models determination of electrical networks. State space model transformation into transfer function. Direct, series and parallel programming. Time and frequency responses. Stability of linear systems. Routh, Hurwitz and Bode stability methods. Nyquist stability criterion. Root locus. Compensator design using root locus and Bode's method.		
Textbooks/references			
1	Č. Milosavljević, Fundamentals of Automatic Control - Part I, Faculty of Electronic Engineering, Niš, 2002 (in Serbian).		
2	Č. Milosavljević, Fundamentals of Automatic Control - Part III, Faculty of Electronic Engineering, Niš, 2002 (in Serbian).		
3	Milić Stojić, Continuous-time Control Systems, Faculty of Electronic Engineering, Niš, 2005.		
4	Č. Milosavljević, Fundamentals of Automatic Control - Methodical Workbook, Faculty of Electronic Engineering, Niš, 1995. (in Serbian)		
5	Č. Milosavljević, Fundamentals of Automatic Control - Manual of Laboratory Exercises, Faculty of Electronic Engineering, Niš, 1995 (in Serbian).		

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; Laboratory exercises			

Grade (maximum number of points 100)

Pre-exam duties	**Points**	**Final exam**	**Points**
Activity during lectures	10	**Written exam**	10
Exercises		**Oral exam**	20
Colloquia	60		
Projects			