
		UNIVERSITY OF EAST SARAJEVO Faculty of Mechanical Engineering							
		Study program: Mechanical Engineering							
		1 ST LEVEL OF STUDIES		3 rd YEAR					
Course title		Basis of automatic control							
Department		Department of production engineering							
Code			Course status		Semester		ECTS		
MAΦ-1-1- MC-06-1-023-5-6-3-1.7-0.3			Mandatory		V		6		
Professor		PhD Saša Prodanović, assistant professor							
Teaching assistant		PhD Saša Prodanović, assistant professor							
Number of hours (per week)			Individual student workload (in hours in semester)			Coefficient of student workload S ₀			
L	E	LE	L	E	LE	S ₀			
3	1.7	0.3	2*15*S ₀	1.7*15*S ₀	0.3*15*S ₀	1.4			
Total total teaching hours in semester 3*15 + 1.7*15 + 0.3*15 = 75 hours				Total student's workload (in hours in semester) 3*15*S ₀ + 1.7*15*S ₀ + 0.3*15*S ₀ = 105 hours					
Total course workload: 75 + 105 = 180 hours in semester									
Student learning objectives		1. Basic knowledge of automatic control. 2. Learning and application the methods required for the analysis and synthesis of control systems within the automatic control system as well as the automatic control system as a whole. 3. Analytical and experimental testing of the basic dynamic and static characteristics of the system. 4. Basic knowledge of Matlab software and its application in automatic control.							
Conditionality		No conditioning							
Teaching methods		Lectures, auditory and laboratory exercises (homework), consultations							
Content of the course by weeks		1. Introduction, concept of automation, importance and application of automatic control. 2. Concept and types of systems, system representation, definition of control, control systems. 3. Automatic control systems (ACS), function and structure of control systems. 4. Controlled objects, components of control systems, concept of analysis and synthesis of ACS. 5. Modeling of ACS, system inputs and responses, performance indicators of controlled object. 6. Mathematical models and technical solutions of transfer components, examples of models in the time domain. 7. Transfer function and transfer matrix, block diagram of the system. 8. Frequency characteristic of the system, Nyquist and Bode diagrams. 9. Frequency characteristics of typical elements and systems and their parameters. 10. Types of system's dominant behaviors and components types, ACS behavior analysis. 11. Amplification and errors. 12. Concepts control and monitoring of ACS. 13. Concepts of controllability and observability. 14. Concept of stability. 15. Stability conditions of linear ACS, criteria of stability, controllability and observability.							
Required literature									
Authors		Name of the publication, publisher			Year		Pages		
Lj. T. Grujić, B. R. Milojković		Automatsko upravljanje, Mašinski fakultet Beograd,			1987.		-		
Lj.T. Grujić		Zadaci sa rješenjima iz automatskog upravljanja, Mašinski fakultet Beograd,			1980.		-		
Additional literature									
Authors		Name of the publication, publisher			Year		Pages		
R.C.Dorf and R.H.Bishop		Modern Control Systems, Addison-Wesley publishing.			1995.		-		
Obligations, forms of knowledge check and assessment		Type of student evaluation				Points		Percentage	
		Pre-exam obligations							
		Attendance at lectures / exercises				10		10%	
		Laboratory exercises (homework)				5		5%	
		Colloquium I				15		15%	
		Colloquium II				25		25%	
		Final exam				45		45%	
		Total				100		100 %	
Web page		http://www.maf.ues.rs.ba/PDF_zaj/PM2017/Osnovi%20automatskog%20upravljanja.pdf							
Date of certification									

