Add. 3	**Course program for the first, second and third level (cycle) of studies**

1.	Course title	Digital control systems				
2.	Code	126				
3.	Study group(s)	ACS				
4.	The organizer of the study program (unit, institute, department)	Faculty of Mechanical Engineering - Skopje, Ss. Cyril and Methodius University in Skopje				
5.	Level (first, second, third)	First				
6.	Academic year / semester	summer	7.	ECTS credits	6	
8.	Instructor	prof. d-r AtanaskoTuneski				
9.	Prerequisites	Systems and control - passed				
10.	Course objectives (competences): Learning the basic discrete digital control systems from systematic and hardware aspects, upgrade of knowledge from Boolean algebra, analysis and synthesis of logical control circuits, analysis of dynamic processes controlled with digital computer. Discretization of the transfer functions and differential equations, stability, error. Analysis of discrete control laws, conditions for use. Synthesis of the control laws.					
11.	Course content: Definition of the types of signals and ways of transfer: continual, discrete in time, discrete in level, discrete digital. Logic, arithmetic, synchronous, asynchronous control circuits, A/D and D/A converters. Model of discrete digital control system, presentation using block diagrams, complex and frequency response, frequency transfer function of the system, Z-transformation, transfer function and response in Z domain, analysis of the response according to time and sampling frequency. Discretization of system differential equations, discrete state and output equations, stability criterions, controllability and observabillity. Control of discrete systems, criterions for control, laws of discrete control, discrete static error and discrete gain.					
12.	Study methods: Interactive teaching, laboratory and/or auditory exercises, standalone and/or team project work, standalone learning.					
13.	Total hours	6ECTSx30 classes = 180 hours				
14.	Hours allocation per activity:	30 + 30 + 30 + 30 + 60 = 180 hours				

15.	Lectures/Lab	15.1.	Lectures	30 hours
		15.2.	Lab (student work)	30 hours
16.	Project Work/Assignments	16.1.	Project assignments	30 hours
		16.2.	Individual assignments	30 hours
		16.3.	Self-study	60 hours

17.	Points/Marks:		
	17.1.	Tests	70 points
	17.2.	Projects	20 points
	17.3.	Attendance	10 points

18.	Grading scale	Under 50	5 (five) (F)
		51 - 60 points	6 (six) (E)
		61 - 70 points	7 (seven) (D)
		71 - 80 points	8 (eight) (C)
		81 - 90 points	9 (nine) (B)
		91 - 100 points	10 (ten) (A)

19.	Prerequisites for taking the final exam	Finished seminar assignments
20.	Language of Instruction	Macedonian
21.	Course evaluation	Student questionnaire

22.	Textbooks					
	22.1.	Instruction materials				
		No.	Author	Title	Publisher	Year
		1.	G.F.Franklin,	Digital Control of	Addison-	1997

			J.D.Powell, M.Workman	Dynamic Systems	Wesley	
		2.	Z.M. Bucevac	Digital systems	Naucna knjiga Beograd	2007
		3.	M.R. Stojic	Continual systems of automatic control	Naucna knjiga Beograd	1985
	22.2.	Supplemental Instruction Materials				
		No.	Author	Title	Publisher	Year
		1.				