

Add. 3		Course program for the first, second and third level (cycle) of studies			
1.	Course title	Computer control of machines and processes			
2.	Code	172			
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 Laze Trajkovski			
9.	Prerequisites	no			
10.	Course objectives (competences): Defining the basic terms of computer control (CC), discrete modeling, designing of a discrete controller, sensors, control signal generation, sequential control using PLC, analysis and design using transformation methods, implementation of process computers, SCADA systems.				
11.	<p>Course content:</p> <ul style="list-style-type: none"> - Definition of the terms: process computers, discrete systems, computer control. - Automation with the help of actuators controlled by programmable logic controller, control with manipulators. - Organization and structure of process computers. Hardware of the process computers. Software for the process computers and programming the process computers. Input output programming. Real-time programming. - Modes of operation of the PLC controller, execution of the program in the PLC controller. - Mathematical model of automatic control system with process computer. Stability of the system for automatic control with process computer. Stability conditions. Criteria for stability of the system for automatic control with process computers. - Applying process computers for automation of the processes and systems. - Analysis and design with the method of transformation. 				
12.	Study methods: Interactive lectures with presentations, laboratory exercises, exercises, tutorials (seminar work), team work, preparation and presentation of project work				
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			80 points
	17.2.	Projects			10 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	Project work			
20.	Language of Instruction	Macedonian			
21.	Course evaluation	Student questionnaire			
22.	Textbooks				
	22.1.	Instruction materials			

No.	Author	Title	Publisher	Year
1.	Т. Колемишева	Компјутерско управување со процеси	ФЕИТ Скопје	2005
2.	J.G.Bollinger, N.A.Duffie	Computer Control of Machines and Processes	Addison Wesley	1989
3.				
Supplemental Instruction Materials				
No.	Author	Title	Publisher	Year
22.2.				
1.	Michael L. Luyben William L. Luyben	Essentials of Process Control	McGraw-Hill	1996
2.	William Dunn	Fundamentals of Industrial Instrumentation and Process Control	McGraw-Hill	2005
3.	S.Bennett	Real-time ComputerControl	Prentice-Hall	1994