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

1.	Course title	FUNDAMENTALS OF MECHATRONIC SYSTEMS				
2.	Code	247				
3.	Study group(s)	PI, TML, TI, HIMV, MSKI, IIM, MV, EE, MHT, AUS, DK				
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	Winter term	7.	ECTS credits		6
8.	Instructor	Associate prof. Viktor Gavriloski, Ph. D.				
9.	Prerequisites	/				
10.	Course objectives (competences): To understand the general principles involved in mechatronic systems. To realize the fundamental components that make up a mechatronic system, including: actuators, sensors, electronics and controllers. Application of data acquisition devices. Integration of components and interfacing sensors and actuators in mechatronic systems. Practical application of mechatronic systems in applications.					
11.	Course content: Basic components of mechatronic systems. Basic structure, functions and characteristics of mechatronic systems. Electronics: application of electronic components in designing simple circuits. Digital electronics: number systems; logic gates; applications of logic gates. Controllers. Sensors and sensor interfacing with controllers and data acquisition cards. Electric actuators: solenoids; DC motors and drives; AC motors and drives; step motors. Actuator interfacing: examples of different actuators interfacing with controllers. Motion Control: sensor principles, position/speed control.					
12.	Study methods: Interactive lectures, auditory practice and/or labaratory practice, self-running and/or team work projects, self-learning.					
13.	Total hours	6 ECTS x 30 Hours = 180 Hours				
14.	Hours allocation per activity:	30 + 45 + 45 + 0 + 60 = 180 Hours				
15.	Lectures/Lab	15.1.	Lectures	30 Hours		
		15.2.	Lab (student work)	45 Hours		
16.	Project Work/Assignments	16.1.	Project assignments	45 Hours		
		16.2.	Individual assignments	0		
		16.3.	Self-study	60 Hours		
17.	Points/Marks:					
	17.1.	Tests	80 points			
	17.2.	Projects	15 points			
	17.3.	Attendance	5 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	completed activities 15.2 и 16.1				

20.	Language of Instruction	Macedonian
21.	Course evaluation	Student questionnaire

22. Textbooks

22.1. Instruction materials

No.	Author	Title	Publisher	Year
1.	V.Gavriloski	Fundamentals of mechatronic systems – lecture notes	Lecture notes development in the frame of the TEMPUS DRIMS project	2011
2.	W. Bolton	Mechatronics : Electronic Control Systems in Mechanical Engineering	Pearson	2008
3.	C. De Silva	Mechatronics: An Integrated Approach	CRC Press	2004

22.2. Supplemental Instruction Materials

No.	Author	Title	Publisher	Year
1.				
2.				
3.				