

Add. 3		Course program for the first, second and third degree of studies				
1.	Course title	Numerical controlled measuring machines and systems				
2.	Code	231				
3.	Study group(s)	PInf				
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 degree)	First				
6.	Academic year / semester	winter	7.	Number of ECTS credits	6	
8.	Professor	Professor Mikolaj Kuzinovski, PhD				
9.	Preconditions for enrolling the course	not have				
10.	Purpose of the course program (competences): Getting of the knowledge for the control (automatic and semi-automatic) of the numerical measuring machines and systems and their practical application in the control of the products.					
11.	Contents of the course program: Study of coordinate measurement techniques, theirs construction, types, application, methods for controls and constraints on their application. Introduction to measurement systems operated with a computer (machines for measuring of the deviation, shape and roughness). Inductive measurement sensors for measuring length.					
12.	Study methods: Interactive teaching, auditory and /or laboratory practical, individual and / or team working on the project assignments, self-study.					
13.	Total available time period	6 ECTS x 30 hours = 180 hours				
14.	Available time assessment	30 + 30 + 30 + 30 + 60 = 180 hours				
15.	Educational activity module	15.1.	Teaching lectures	30 hours		
		15.2.	Practice, seminars, team work	30 hours		
16.	Other activity module	16.1.	Project assignments	30 hours		
		16.2.	Selfrunning assignments	30 hours		
		16.3.	Home studying	60 hours		
17.	Evaluation methods					
	17.1.	Tests	70 points			
	17.2.	Projects	20 points			
	17.3.	Activity and participation	10 points			
18.	Evaluation criteria (points and marks)		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.	Signature and final exam requirements		The realized activities 15.2; 16.1 and 16.2			
20.	Language used for performing the teaching		Macedonian language			
21.	Method used for following the teaching quality		The polling and other forms of continuous evaluation			
22.	References					
	22.1.	Main references				
		No.	Author	Title	Publisher	Year

		1.	M. Kuzinovski	Numerical controlled measuring machines and systems (reproduced lectures)	Faculty of mechanical engineering-Skopje	2012
		2.	E. Ratajczyk	Wspolrzdnościowa technika pomiarowa	Oficina Wydawnicza Politechniki Warszawskiej	2005
		3.				
	22.2.	Additional references				
		No.	Author	Title	Publisher	Year
		1.	ISO	ISO/TR 10360-1:2000 Co-ordinate metrology.- Part 1. Definitions and applications of the fundamental geometric principles.	ISO	2000
		2.	ISO	ISO 10360-2: 2009 Co-ordinate metrology.- Part 2. Performance assessment of coordinate measuring machines.	ISO	2009
		3.	ISO	ISO 10360-3: 2000 Co-ordinate metrology.- Part 3. Performance test for CMMs with a rotary axis as the forth axis.	ISO	2000