Add. 3	Course program for the first, second and third degree of studies			

1.	Course title	Automation in Production and Service Activities		
2.	Code	103		
3.	Study group(s)	Production Informatics, Industrial Engineering and management		
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	summer semester	7.	Number of ECTS credits	6
8.	Professor	Prof. Dr. Zoran PANDILOV		
9.	Preconditions for enrolling the course	no		
10.	Purpose of the course program (competences): Introduction with the basic elements of the automation in production and service activities. Recognition with the elements of the automation in production and service activities and justification of their practical application.			
11.	Contents of the course program: Introduction in automation. Application of automation in production and service activities. Basic elements of automated systems. Types of automation. Numerical control. Application of Numerical Control. Industrial robotics. Application of industrial robots. Programmable Logical Controllers. Flexible Manufacturing Systems (FMS). Application of Flexible Manufacturing Systems (FMS) and their advantages. CAD, CAM, CAD/CAM. Computer Integrated Manufacturing (CIM).			
12.	Study methods: interactive lectures, auditory exercises and/or laboratory exercises, individual and/or team work on projects, individual learning			
13.	Total available time period	6 ECTS x 30 hours=180 hours		
14.	Available time assessment	30 + 30 + 40 + 20 + 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	40 hours
		16.2.	Self running assignments	20 hours
		16.3.	Home studying	60 hours
17.	Evaluation methods			
	17.1.	Tests		60 points
	17.2.	Projects		30 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	Realized activities 17.2 and 17.3		
20.	Language used for performing the teaching	Macedonian language		
21.	Method used for following the teaching quality	Questionnaires, and other forms of continual evaluation		

22.	References					
		Main references				
	22.1.	No.	Author	Title	Publisher	Year
		1.	Zoran Pandilov	Lecture notes in Automation in Production	Faculty of Mechanical	

				and Service Activities	Engineering Skopje	
		2.	Shimon Y. Nof (Editor)	Handbook of Automation	Springer	2009
		3.	Mikell P. Groover	Automation, Production Systems, and Computer-Integrated Manufacturing (3rd Ed)	Prentice Hall	2007
	22.2.	Additional references				
		No.	Author	Title	Publisher	Year
		1.	Suk-Hwan Suh, Seong-Kyoon Kang, Dae-Hyuk Chung, Ian Strou	Theory and design of CNC systems	Springer	2008
		2.	Bruno Siciliano and Oussama Khatib	Handbook of Robotics	Springer	2008
		3.	Tullio Tolio	Design of Flexible Production Systems: Methodologies and Tools	Springer	2009