Add. 3		Course program for the first, second and third degree of studies			
1.	Course title	Numerical Control and CAD/CAM			
2.	Code	232			
3.	Study group(s)	Production Engineering			
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 numerical control, programming of the numerical control machine tools, with CAD/CAM systems and their application.				
11.	Contents of the course program: Numerical Control (NC). History of the Numerical Control. Basic elements of the NC technology. Computer Numerical Control. Direct Numerical Control. Distributive Numerical Control and Adaptive Control. Classification of NC systems. Design characteristics of Numerical Control Machines. Application of NC. Types of part programming of Numerical Control Machines. History of the CAD/CAM systems. Basic elements of the CAD/CAM systems. CAD/CAM hardware. CAD/CAM software. Connection of CAD/CAM system with Numerical Control Unit.				
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.	Selfrunning 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 Numerical Control and	Faculty of Mechanical	

				CAD/CAM	Engineering Skopje	
		2.	Suk-Hwan Suh, Seong-Kyoon Kang, Dae-Hyuk Chung, Ian Strou	Theory and design of CNC systems	Springer	2008
		3.	Kunwoo Lee	Principles of CAD/CAM/CAE	Prentice Hall	1999
	22.2.	Additional references				
		No.	Author	Title	Publisher	Year
		1.	P.Radhakrishan, S.Subramanyan, V. Raju	CAD/CAM/CIM	New Age International Publishers	2008
		2.	Lacalle L.N.L. de, Lamikiz A	Machine Tools for High Performance Machining	Springer	2008
		3.	Alan Overby	CNC Machining Handbook	McGraw-Hill	2011