

Add. 3		Course program for the first, second and third degree of studies			
1.	Course title	Non-conventional joining techniques			
2.	Code	227			
3.	Study group(s)	MJSE,DS			
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	Prof. Dobre Runchev, Ph.D			
9.	Preconditions for enrolling the course	Joining techniques - passed			
10.	Purpose of the course program (competences):  Selection, preparation and realization of technologies to brazing, adhesive bonding and new specialized welding methods for various types of metallic and non-metallic materials.				
11.	Contents of the course program:  Introduction to various joining techniques for elements made from different materials. Realization of joining technology with soldering, brazing and adhesive bonding. Introduction of new specialized welding methods in specific areas: Joining electrical and electronics elements. Joining of polymer materials - plastic. Friction Stir Welding (FSW). Shielding gas laser welding. Hybrid welding technique. Explosive welding. TIME and TIME TWIN welding. Stud welding. Aluminothermic welding.				
12.	Study methods: Interactive lectures, auditory and/or laboratory practice, individual and/or team work on project assignments, individual study.				
13.	Total available time period	6ECTSx30 hours =180 hours			
14.	Available time assessment	30+30+12+ 8+100=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	12 hours	
		16.2.	Selfrunning assignments	8 hours	
		16.3.	Home studying	100 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	Realization of activities 15.1, 15.2, 16.1 and 16.2			
20.	Language used for performing the teaching	Macedonian language			
21.	Method used for following the teaching quality	Questioners and other forms of continues evaluation			
22.	References				

	22.1.	Main references				
		No.	Author	Title	Publisher	Year
		1.	Добре Рунчев	Некнвенционални постапки на спојување	Универзитет Св. кирил и Методиј во скопје	2004
		2.				
	3.					
	22.2.	Additional references				
		No.	Author	Title	Publisher	Year
		1.	Johanes Wilden	Lichtbogenfügeprozesse Stand der Technik und Zukunftspotenziale	DVS Media	2008
		2.	M.Smiljanic, V.Martinovski	Lemljenje	DUZS Biblioteka Praksa kniga 3	2001
	3.	Gerd Habenicht	Applied Adhesive Bonding, A Practical Guide for Flawless Results	WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim	2009	