

Add. 3		Course program for the first, second and third degree of studies			
1.	Course title	Joining techniques			
2.	Code	311			
3.	Study group(s)	PI, TML, TI, HIMV, MJSE, IIM, MV,EE, MHT,AUS, IND, 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	Mechanical materials 1 - passed Materials, technologies and testing - passed for IND			
10.	Purpose of the course program (competences): Identifying various types of joining techniques: welding, soldering, brazing and adhesive bonding. Recognition of their basic characteristics, mode of implementation and application areas.				
11.	Contents of the course program: Introduction to various joining techniques: welding, soldering, brazing and adhesive bonding. Introducing basics of welding with thermo-chemical heat sources, electric arc, electric resistance, and other electrical and mechanical sources. Introduction to the basics of soldering and brazing. Introducing the basics of adhesive bonding. Introducing the safety in welding and related processes. The symbolic representation of joining techniques on drawings.				
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+ 0 +8+112=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	0 hours	
		16.2.	Selfrunning assignments	8 hours	
		16.3.	Home studying	112 hours	
17.	Evaluation methods				
	17.1.	Tests			80 points
	17.2.	Projects			10 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, 16.2			
20.	Language used for performing the teaching	Macedonian language			

21.	Method used for following the teaching quality	Questioners and other forms of continues evaluation
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22.	References				
22.1.	Main references				
	No.	Author	Title	Publisher	Year
	1.	Добре Рунчев	Техники на заварување - скрипта	Машински факултет - Скопје	2011
	2.	Добре Рунчев	Неконвенционални постапки на спојување	Универзитет Св. Кирили и Методиј во Скопје	2004
3.	Дончо Чалоски	Заварување	Универзитет Св. Кирили и Методиј во Скопје	1983	
22.2.	Additional references				
	No.	Author	Title	Publisher	Year
	1.	Helmut Richter, u.a	Fügetechnik, Schweißtechnik	DVS Verlag	1995
	2.	Richard A. Strahl	Introduction to Welding Engineering	Kendall Hunt Pub Co	2009
3.	M. G. Nicholas	Joining processes: introduction to brazing and diffusion bonding	Kluwer Academic Publishers	1998	