

Add. 3		Course program for the first, second and third level (cycle) of studies				
1.	Course title	Waste Water Treatment				
2.	Code	318				
3.	Study group(s)	HEWM, EE				
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)	First				
6.	Academic year / semester	Summer	7.	ECTS credits	6	
8.	Instructor	Assoc. prof. Zoran Markov				
9.	Prerequisites					
10.	Course objectives (competences): Learning about the origin, properties, collection and treatment methods of the municipal and industrial waste water.					
11.	Course content: Physical and chemical properties of the waste water. Preliminary treatment (bars and screens). Primary treatment. Secondary (biological) treatment. Biological removal of nutrients. Natural clarification processes. Physical and chemicals treatment procedures. Classification of the water quality. Industrial waste water (removal of solids, grease and oil matter, pH control, ion exchange, adsorption).					
12.	Study methods: interactive lectures, auditory practice and/or laboratory practice, self running and/or team work projects, self learning					
13.	Total hours	6 ECTS x 30 hours = 180 hours				
14.	Hours allocation per activity:	30 + 30 + 30 + 0 + 90 = 180 hours				
15.	Lectures/Lab	15.1.	Lectures	30 hours		
		15.2.	Lab (student work)	30 hours		
16.	Project Work/Assignments	16.1.	Project assignments	30 hours		
		16.2.	Individual assignments	0 hours		
		16.3.	Self-study	90 hours		
17.	Points/Marks:					
	17.1.	Tests			80 points	
	17.2.	Projects			10 points	
	17.3.	Attendance			10 points	
18.	Grading scale	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.	Prerequisites for taking the final exam	Fulfilled activity 17.2				
20.	Language of Instruction	Macedonian				
21.	Course evaluation	Student questionnaire				
22.	Textbooks					
22.1.	Instruction materials					
	No.	Author	Title	Publisher	Year	
	1.	Марков З.	Системи за пречистување на отпадни флуиди	Интерна скрипта, МФС	2011	
2.	Златановски Т.	Отпадни флуиди и пречистителни	Предавања,	2004		

				станции	МФС	
		3.				
	22.2.	Supplemental Instruction Materials				
		No.	Author	Title	Publisher	Year
		1.	Water Environment Federation	Operation of Municipal Waste Water Treatment Plants	McGraw-Hill	2008
		2.	Industrial Wastewater Management, Treatment and Disposal Task Force of the Water Environment Federation	Industrial Wastewater Management, Treatment and Disposal	McGraw-Hill	2008
		3.	Lee C.C.	Handbook of environmental engineering calculations	McGraw-Hill	2007