

Add. 3		Course program for the first, second and third level (cycle) of studies			
1.	Course title	Hydropower plants			
2.	Code	327			
3.	Study group(s)	EE, HEWM			
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	prof. d-r Predrag Popovski			
9.	Prerequisites	Hydraulic turbines - signature			
10.	Course objectives (competences): Energy exploration of the water and wind. Study of the types of plants (water and wind turbines) and design conditions and operation of the hydropower plants and wind power plants. Introduction to the methods for selection of equipment and technical solutions for different site parameters of the plants. Ability to design and management of the hydropower plants.				
11.	Course content: Energy exploration of the water and wind, methods for prediction of the energy available. Basic concepts and types of hydropower plants. Design and working performance of the turbine types according to the conditions of operation in the hydropower plants. Selection of disposition and overall dimensions of the turbines in the power plant. Site conditions and types of hydropower plants. Pumped-storage power plants, types of units, operational characteristics and disposition solutions. Technical and economic parameters and methods for the selection of the installed capacity of the power plant. Environmental and social aspects of the construction and exploration of the hydropower plants and wind power plants. Types, design conditions and utilization of the small hydropower plants.				
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 + 45 + 30 + 15 + 60			
15.	Lectures/Lab	15.1.	Lectures	30 hours	
		15.2.	Lab (student work)	45 hours	
16.	Project Work/Assignments	16.1.	Project assignments	30 hours	
		16.2.	Individual assignments	15 hours	
		16.3.	Self-study	60 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				
20.	Language of Instruction		Macedonian		
21.	Course evaluation		Student questionnaire		
22.	Textbooks				
	22.1.	Instruction materials			
		No.	Author	Title	Publisher

		1.	Поповски П.	Хидрцентрали	Печатени предавања	2009
		2.	Begovic K.	Hidroenergetska postrojenja	FBS - Zagreb	1998
		3.	Pilic-Rabadan Lj.	Vodne turbine i pumpe, vjetroturbine	FBS - Split	2000
	22.2.	Supplemental Instruction Materials				
		No.	Author	Title	Publisher	Year
		1.	Ристиќ М.	Хидромашинска опрема	Научна књига Белград	2002
		2.	Кривченко Г.И.	Гидравлические станции	Енергоиздат - С.Петербург	1996