

Add. 3		Course program for the first, second and third level (cycle) of studies				
1.	Course title	Heating and air conditioning				
2.	Code	123				
3.	Study group(s)	TE				
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	Winter	7.	ECTS credits	6	
8.	Instructor	Vasko Sharevski				
9.	Prerequisites	no				
10.	Course objectives (competences): Thermal calculations of the systems for heating, cooling, ventilation and air conditioning of residential, commercial and industrial objects; basis of design of heating, ventilation and air conditioning systems; optimal energy efficient objects and systems					
11.	Course content: Optimum microclimate working and environment conditions, calculation of heat losses / gains, calculation and selection of heaters, different heating systems pipeline calculation, heating systems schemes, basis of heating systems regulation; district heating and cooling systems connection; air conditioning, changes of state of moist air and thermal calculations for winter and summer air conditioning regime, air conditioning systems, ventilation, calculation and channel dimensioning for air distribution, basis of HVC systems regulation, basis of HVC systems designing, energy performance and efficiency of the objects and HVC systems.					
12.	Study methods: Interactive lectures, exercises auditory and / or laboratory, individual and / or team work project tasks, self-learning.					
13.	Total hours	6 ECTS x 30 = 180 hours				
14.	Hours allocation per activity:	30 + 30 + 30 + 30 + 60 = 180 hours				
15.	Lectures/Lab	15.1.	Lectures	30		
		15.2.	Lab (student work)	30		
16.	Project Work/Assignments	16.1.	Project assignments	30		
		16.2.	Individual assignments	30		
		16.3.	Self-study	60		
17.	Points/Marks:					
	17.1.	Tests	70 points			
	17.2.	Projects	20 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	No				
20.	Language of Instruction	Macedonian				
21.	Course evaluation	Student questionnaire				
22.	Textbooks					
	22.1.	Instruction materials				
		No.	Author	Title	Publisher	Year

		1.	B.Todorovic	Design heating systems	MF Belgrade	2005
		2.	J.J.Sokolov	District heating systems and networks	Грађевинска књига Београд	1984
		3.	ASHRAE Hanbook,	Fundamentals	Atalanta	2005