1.	Course title	**Parallel processing**	
2.	Course code	KMET-I-02	
3.	Study program	**Computer networks and e-technologies**	
4.	Unit offering the course	**FCSE**	
5.	Undergraduate/master/PhD	**Master**	
6.	Year/semester 1(2)/winter/elective	7. ECTS: **6**	
8.	Teacher(s)	Assist. Prof. Igor Mishkovski	
9.	Course prerequisites	None	
10.	Goals (competences): After successfully completing the course, the student is expected to understand the parallel algorithms, parallel architectures ad multithreading systems. The student will posses the know how on creation of parallel applications.		
11.	Course content: Fundamental concepts of parallel algorithms. Parallel algorithms complexity. 2D algorithms. Hypercube architectures and algorithms. GPU architecture. Instruction level parallelism. Memory hierarchy design. Multiprocessor parallelism and multithreading. MPI programming. OpenMP programming. GPU programming using CUDA and OpenCL. Interconnection networks and clusters. GRID structures and calculations. Pipelining. Performances and optimization.		
12.	Teaching methods: Lectures supported by slide presentations, interactive lectures, trainings (using lab equipment and software packages), team work, case studies, invited guests and lectures, individual practical assignments presentations, seminar paper, e-learning (forums, consultations).		
13.	Total available time	6 ECTS x 30 hours = 180 hours	
14.	Distribution of the available time	30 + 15 + 135 = 180 hours	

15.	Teaching activities	15.1.	Lectures	30 hours
		15.2.	Training (labs, problem solving), seminar and team work	15 hours
16.	Other activities	16.1.	Project work	60 hours
		16.2.	Self study	25 hours
		16.3.	Home work	50 hours

17.	Grading		
	17.1.	Tests	50 points
	17.2.	Seminar work/project (written or oral presentation)	35 points
	17.3.	Active participation	15 points

18.	Grading criteria	to 59 points	5 (five) (F)
		from 60 to 68 points	6 (six) (E)
		from 69 to 76 points	7 (seven) (D)
		from 77 to 84 points	8 (eight) (C)
		from 85 to 92 points	9 (nine) (B)

			from 93 to 100 points		10 (ten) (A)	
19.	Final exam prerequisites		Successfully completed activities 15.1 and 15.2			
20.	Course language		Macedonian and English			
21.	Quality assurance methods		Internal evaluation and student questionnaires			
22.	Literature					
	22.1.	Compulsory				
		No.	Authors	Title	Publisher	Year
		1.	Calvin Lin, Larry Snyder	Principles of Parallel Programming	Pearson Education	2008
		2.	J. Hennesey, D. Patterson	Computer Architecture: A Quantitative Approach	Kaufmann	2003
		3.	Joshy Joseph, Craig Fellenstein	Grid Computing	Prentice Hall PTR	2004
	22.2.	Additional				
		No.	Authors	Title	Publisher	Year
		1.		Selected IEEE and ACM publications		
		2.				
		3.				