1.	Course		*Advanced Topics in Parallel Processing*	
2.	Code		KNI_E10	
3.	Study programme		Computer Science and Engineering PhD study programme	
4.	Study programme organized by		FCSE	
5.	Cycle		Third – PhD	
6.	Academic year / semester winter/summer/elective		7. ECTS credits 7,5	
8.	Teacher		Prof. d-r Dimitar Trajanov, Prof. d-r Sonja Filiposka	
9.	Prerequisites		None	
10.	Course programme goals (competences): The student will be capable to analyse and design parallel architectures and programmes using various methods and techniques.			
11.	Course syllabus: The course reviews the advances in sequential computers for increasing of the computing rate and applies these techniques in order to realize today's supercomputers. The topics that are discussed include parallel computer architecture; basic concepts fro parallel algorithm design and parallel programming. Comparison of programming methodologies for multiprocessor systems with distributed and shared memory, vector processors. Comparison of statics and dynamic task distribution in grid environment, using clusters and virtualization. Overview of methods for analysis of parallel architectures and programs. Introducing techniques and skills required for performance measurements as well as scalability problem solving. Future directions for parallel processing and experimental methodologies are introduced in order to enable a new insight into the development of fresh solutions to existing problems.			
12.	Teaching methods: Classes supported with slide presentations, interactive teaching, lab equipment and other software packages, teamwork, case studies, invited guest lecturers, presentations of project works, e-learning materials, forums and consultations.			
13.	Total fund of work hours		7,5 EKTC x 30 h = 225 h	
14.	Available hours distribution		45+30+150 = 225	
15.	Teaching activities	15.1.	Theoretical classes	45 h
		15.2.	Practical classes (labs, exercises), seminars, team work	30 h
16.	Other activities	16.1.	Project tasks	50 h
		16.2.	Self study	50 h
		16.3.	Homework	50 h
17.	Grading			
	17.1.	Tests		40 points
	17.2.	Seminar work/ project (presentation: written and oral)		50 points
	17.3.	Active participation		10 points
18.	Grading criteria (points/grade)		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.	Conditions for attending the final exam		Successful completion of activities 15.1 and 15.2		
20.	Language		Macedonian or English		
21.	Quality assessment		Internal evaluation and student pools		
22.	Literature				
	22.1.	Compulsory			
		No.	Author	Title	Publisher	Year
		1.	Calvin Lyn, Lawrence Snyder	Principles of Parallel Programming	Pearson Addison Wesley	2009
		2.	Maurice Herlihy, Nir Shavit	The Art of Multiprocessor Programming	Elsevier Science & Technology Books	2008
		3.	Ronald W. Shonkwiler, Lew Lefton	Parallel and Vector Scientific Computing	Cambridge University Press	2006
	22.2.	Additional				
		No.	Author	Title	Publisher	Year
		1.	J. Hennesey, D. Patterson	Computer Architecture: A Quantitative Approach	Kaufmann	2003
		2.				
		3.				