1.	Course Title	Parallel programming		
2.	Code	F18L3S149		
3.	Study program	Software engineering and information systems		
4.	Study Program Organizer	Faculty of Computer Science and Engineering		
5.	Degree (first, second, third cycle)	first cycle		
6.	Academic year / semester 3 / summer / mandatory	7. ECTS credits 6		
8.	Teacher	full professor Marjan Gushev, assistant professor Vladimir Zdraveski		
9.	Course enrollment prerequisites	Алгоритми и податочни структури		
10.	Course program goals (competencies): Research of the algorithms and programming techniques of the newest parallel platforms with shared and distributed memory. The student will learn the theoretical and practical (programmatical) components.			
11.	Course program content: (1) Introduction. Overview of the parallel systems challenges. (1) Basics of parallel computing, models, algorithms. (1) Special custom architectures. (2) Problems and solutions in synchronization of multiple threads, multi-threading systems. (1) Parallel systems, introduction to parallel programming models. (1) Parallel algorithm design. (2) Shared memory and MPI. (2) GPU architecture and CUDA programming. (1) Analysis and performance. (1) Optimization			
12.	Learning methods: Lectures using presentations, interactive lectures, exercises (using equipment and software packages), teamwork, case studies, invited guest lecturers, independent preparation and defense of a project assignment and seminar work.			
13.	Total available time	6 ECTS x 30 hours = 180 hours		
14.	Distribution of the available time	30 + 45 + 15 + 15 + 75 = 180 hours		
15.	Teaching activity forms	15.1.	Lectures – theoretical teaching	30 hours
		15.2.	Exercises (laboratory, auditory), seminar papers, teamwork	45 hours
16.	Other activity forms	16.1.	Project Tasks	15 hours

		16.2.	Independent Learning Tasks	15 hours
		16.3.	Home learning	75 hours

17.	Assessment methodology		
	17.1.	Tests	10 points
	17.2.	Seminar paper/project (presentation: written and oral)	10 points
	17.3.	Activity and learning	10 points
	17.4.	Final exam	70 points

18.	Assessment criteria (points/grade)	up to 50 points	5 (five) (F)
		51 to 60 points	6 (six) (E)
		61 to 70 points	7 (seven) (D)
		71 to 80 points	8 (eight) (C)
		81 to 90 points	9 (nine) (B)
		91 to 100 points	10 (ten) (A)
19.	Course completion and final exam requirements	Realized activities 15.1 and 15.2	
20.	Teaching Language	Macedonian and English	
21.	Teaching quality evaluation method	Internal evaluation mechanisms and questionnaires	

22. Course Material

22.1. Mandatory course material

No.	Author	Title	Publisher	Year
1	Jason Sanders, Edward Kandrot	Cuda by example	Addison-Wesley	2010
2	Shane Cook	Cuda programming	Elsevier	2013
3	David B. Kirk, W. Hwu Wen-Mei	Programming massively parallel processors: a hands-on approach	Morgan Kaufmann	2016

22.2. Additional course material

No.	Author	Title	Publisher	Year