1.	Course Title	Algorithm design
2.	Code	F18L2S097
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 2 / summer / mandatory	7. ECTS credits 6
8.	Teacher	associate professor Marija Mihova
9.	Course enrollment prerequisites	Објектно ориентирано програмирање
10.	Course program goals (competencies): Upon completion of this course, students will become familiar with major algorithms and data structures and he will be able to apply important algorithmic design paradigms and methods of analysis and synthesize efficient algorithms in common engineering design situations. He will also learn to analyze the asymptotic performance of algorithms, and check the correctness of algorithms.	
11.	Course program content: Definition of an algorithm. Techniques for algorithm design and complexity analysis. Multidimensional dynamic programming and greedy algorithms. Memoization in DP. Graph searching (classification of edges and vertices, visiting time).All-pairs shortest paths from algorithms with application. Reweighting. Union find, Fibonacci heaps and other advanced structures. Network flow and min-cut max-flow theorem. Search trees (segment, interval index). String processing. Geometric algorithms.	
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 25 hours = 150 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	Thomas H. Carmen et all	Introduction to algorithms	MIT Press	2009
2	Jon Cleindberg, Eva Targos	Algorithm design	Pearson Education, Inc	2006
3		http://mendo.mk/Welcome.do		0
4		codefu.mk		0
5		www.topcoder.com		0
6				0

22.2.	Additional course material			
No.	Author	Title	Publisher	Year