1.	Course title	Discrete Mathematics 2		
2.	Course code	CSES203		
3.	Study program	CSE, CNT, EI, AIS, ICE, PITS		
4.	Unit offering the course	**FCSE**		
5.	Undergraduate/postgraduate/PhD	**Undergraduate**		
6.	Year/semester First/Spring	7. ECTS: **6**		
8.	Teacher(s)	Prof. Smile Markovski, PhD, Prof. Zaneta Popeska, PhD, assoc. Prof. Marija Mihova, PhD, assit. Prof. Vesna Dimitrova, assit. Prof. Dejan Spasov, assit. Prof. Boro Jakimovski		
9.	Course prerequisites	Discrete mathematics 1		
10.	Goals (competences): To introduce the student to basics of Boolean algebra, its role and application in computer sciences and informatics technologies. To overcome the basic counting techniques and learn how to apply them in solving practical problems. To learn to solve recurrence relations. To introduce students to matrices and matrix algebra and systems of linear equations. To learn the terminology in graph theory and how to apply graphs in modelling and solving practical problems in computer sciences.			
11.	Course content: Boolean algebra: Boolean functions, representing Boolean functions, logic gates, minimization of circuits. Matrices and matrix algebra. Solving systems of linear equations. Counting techniques: the pigeonhole principle, permutations and combinations, binomial coefficients. Advanced counting techniques: recurrence relations and solving linear recurrence relations, Divide-and-conquer algorithm and recurrence relations, generating functions, inclusion-exclusion principle. Graphs and their representation. Connectivity, Euler and Hamilton paths. Shortest-path problem, planar graphs and graph coloring. Trees: definitions, properties and applications, tree traversal, spanning trees, minimum spanning trees. Laboratory work using open course software or individual programing.			
12.	Teaching methods: Lectures supported by slides, interactive lecturing, solving problems in class and in computer laboratory, individual work on homework and projects.			
13.	Total available time	6 ЕЦТС x 30 hours = 180 hours		
14.	Distribution of the available time	45 + 30+15 + 90 = 180 hours		

15.	Teaching activities	15.1.	Lectures	45 hours
		15.2.	Training (labs, problem solving), seminar and team work	45 hours
16.	Other activities	16.1.	Challenging problems	10 hours
		16.2.	Self study	80 hours

17.	Grading		
	17.1.	Tests	90 points
	17.2.	Lab exam	10 points
	17.3.	Challenging problems	10 extra points

18.	Grading criteria	to 50 points	5 (five) (F)
		from 51 to 60 points	6 (six) (E)
		from 61 to 70 points	7 (seven) (D)
		from 71 to 80 points	8 (eight) (C)
		from 81 to 90 points	9 (nine) (B)

				from 91 to 100 points		10 (ten) (A)	
19.	Final exam prerequisites			Realised activities in 15.1 and 15.2			
20.	Course language			Macedonian and English			
21.	Quality assurance methods			Internal evaluation and surveys			
22.	Literature						
	22.1.	Compulsory					
		No.	Authors	Title	Publisher	Year	
		1.	Kenneth H. Rosen, AT&T Laboratories	DISCRETE MATHEMATICS AND ITS APPLICATIONS, SIXTH EDITION International Edition, ISBN-13: 978-007-124474-9	The McGraw-Hill Companies	2007	
	22.2.	Mandatory					
		No.	Authors	Title	Publisher	Year	
		1.	Rowan Garnier and John Taylor *University of Brighton, UK*	Discrete Mathematics for New Technology Second Edition, ISBN 0 7503 0652 1	IOP Publishing Ltd	2002	