

1.	Course title	Discrete mathematics 1		
2.	Course code	CSEW103		
3.	Study program	CSE, CNT, EI, AIS, ICE, PITS		
4.	Unit offering the course	FCSE		
5.	Undergraduate/postgraduate/PhD	Undergraduate		
6.	Year/semester First/Winter	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	High school math		
10.	Goals (competences): To introduce students to basic elements of discrete mathematics as a foundation of computer sciences and new technologies. In this context students should learn how to apply the formal methods of propositional and predicate logic in modeling situations from real life including those in the field of computer sciences. To learn and apply basic proof methods and the methods of mathematical induction. To explain with examples the terminology, operations in the theory of sets, functions and relations and their application.			
11.	Course content: Elements of mathematical logic, propositions, and logical operations, truth tables and compound propositions, tautologies and major Laws of logic, disjunctive normal forms, predicates and quantifiers, rules of inference. Introduction to proof methods and strategies. Sets, subsets, algebra of sets and properties. Functions: Definitions, types of functions, composition of functions, inverse functions. Sequences and sums. Cardinality of sets. Integers and divisibility. Induction and recursion: mathematical induction and the principle of strong mathematical induction. Recursive definitions and structural induction, recursive algorithms. Relations and their properties, n-ary relations and their applications, Graph and matrix representation of relations. Closures of relations. Special type of relations: equivalence relations and partial ordering.			
12.	Teaching methods: Lectures supported by slides, interactive lecturing, solving problems in class, individual work on homework and projects.			
13.	Total available time	6 ECTS x 30 hours = 180 hours		
14.	Distribution of the available time	45 + 45+10+80 = 180 hours		
15.	Teaching activities	15.1.	Lectures	45 hours
		15.2.	Training (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	100 points	
	17.2.	Challenging problems (extra points)	10 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			
	Compulsory			
	No.	Authors	Title	Publisher
	22.1.			
	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
	Mandatory			
No.	Authors	Title	Publisher	
22.2.				
1.	Rowan Garnier and John Taylor <i>University of Brighton,</i> <i>UK</i>	Discrete Mathematics for New Technology Second Edition, ISBN 0 7503 0652 1	IOP Publishing Ltd 2002	