

Specification for the book of courses

Study program		Electrical Engineering and Computer Science		
Module		Control Systems		
Type and level of studies		Undergraduate Academic Studies		
The name of the course		Discrete Mathematics		
Lecturer (for lectures)		Milovanović Ž. Igor		
Lecturer/associate (for exercises)		Matejić M. Marjan, Milošević D. Predrag		
Lecturer/associate (for OFE)				
Number of ECTS	5	Course status (obligatory/elective)	Elective	
Prerequisites				
Course objectives	This course covers widely applicable mathematical tools for computer science, including topics from logic, set theory, combinatorics, number theory and graph theory. It includes mathematical logic, sets, relations and functions, combinatorics, basic graph theory.			
Course outcomes	Regarding knowledge and understanding the student is expected to be able to on completion of the course to analyze given problem logically, solve combinatorial problems, apply basic graph and number theory for problem-solving and calculation.			
Course outline				
Theoretical teaching	Mathematical logics. Propositional calculus. Propositional functions. Coexistence and logical consequences. Normal forms. Sets. Representations. Operations on sets. Principle of sum. Principle of inclusion-exclusion. Partitive sets. Cartesian product. Principle of product. Relations. Matrix representations. Ordering relations. Equivalence relations. Lexicographical ordering. Functions. Principles of injection, surjection, bijection and complement. Dirichlet principle. Sequences. Generating functions. Recurrent sequences. Solving linear recurrent relations. Fibonacci, Catalan and Stirling numbers. Finite differences and sums. Permanent. Computation and properties. Permanent matrix in special form. Systems of different representatives. Integers. Divisibility. GCD. Euclid algorithm. Diophantine equations. Modular equations. Chinese remainder theorem. Euler function. Little Fermat theorem. Modular arithmetics. Graphs. Representations. Components of graph. Paths. Connectivity. Transitive closure. Isomorphism. Trees. Planar graphs. Graph coloring.			
Practical teaching (exercises, OFE, study and research)	Oral exercises that exemplify problem statements examined in the lectures.			
Textbooks/references				
1	James A. Anderson, Discrete Mathematics with Combinatorics, Second Edition, Prentice Hall, 2003.			
2	Susanna S. Epp, Discrete Mathematics with Applications, Fourth Edition, Brooks/Cole Cengage Learning, 2011			
3				
4				
5				
Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
2	2	0	0	0
Teaching methods	Lectures and exercises			
Grade (maximum number of points 100)				
Pre-exam duties	Points	Final exam		Points
Activity during lectures	10	Written exam		20
Exercises		Oral exam		40
Colloquia	30			
Projects				