Study Program: Informatics

Type and level of studies: Bachelor studies

Course name: Discrete structures

Lecturer: Valjarević J. Dragana

Status: Compulsory

ECTS: 7

Attendance Prerequisites: Basic, high-school level mathematics knowledge.

Course aims

Acquiring basic knowledge from Discrete Structures, networks and graphs, mathematical models.

Course outcome

The students possess basic knowledge about Discrete Structures, networks and graphs, mathematical models.

Course content

Theoretical part

Introduction to discrete mathematical structures. The notion of continuous mathematics. Mathematical models. Generatrix functions. Recurrent sequence. Special numerical sequences. Stirling numbers of the first and second kind. Bell numbers. Euler numbers. Cauchy numbers. Convex sequences.

Classes of configurations. Exact differential sets. Some special classes of matrices, Hadamard and Stochastic matrices. Permutation matrices. Permanents of matrices. Classic combinatorics elements. Permutation, variation, combination, partition. Permutations with element repetition. Permutations with ups and downs. Circular permutation. Variations. Combinations. Combinations with repetition. Partition and composition. Combination and enumeration. Algorithms for solving basic combinatorics problems. Sorting. Searching. Combinatorial configurations. Block schemes. Tactical configurations. Systems of different representatives. Definite planes. Latin rectangle. Magic square. Graphs. Notion and concept of graphs. Definition of graphs. Undirected graphs. Graph parts. Paths in graphs. Graph connectivity. Graph operations. Non-oriented graphs. Tree. Planar graphs. Graph colouring. Determining the shortest path in the graph. Oriented graphs. Node exponent. Parts of graph. Connectivity. Oriented trees.

Literature

1. ДИСКРЕТНЕ МАТЕМАТИКА, Игор Ж Миловановић, Емина Миловановић, Електронски факултет у Нишу, 2000.
2. ДИСКРЕТНЕ МАТЕМАТИКА, збирка задатака, Игор Ж Миловановић, Емина Миловановић, Електронски факултет у Нишу, 2000.

Number of active classes				Other classes
Lectures: 3	Practical classes: 3	Other forms of teaching:	Students' research work	

Teaching methods

Lectures, auditory practice, laboratory, term tests, consulting, homework, written exam.

Assessment (maximum 100 points)

Course assignments	**points**	Final exam	**points**
activity during lectures	**10**	written exam	**20**
practical classes		oral exam	**30**
term test(s)	**40**		
seminar(s)		.....	
Total	**50**		**50**