Study programme(s): Information Technologies	
Level: Bachelor	
Course title: Discrete Structures 2	
Lecturer: Dragan Mašulović, Maja Pech	
Status: obligatory	
ECTS: 7	
Requirements: Discrete Structures 1	

Learning objectives

In this course students shall acquire deeper knowledge of discrete processes that are vital to computer science and will understand basic counting strategies, systems of linear equations, determinants and matrices, classical algebraic structures and applications in understanding simpler problems in graph theory.

Learning outcomes

At the end of the course a successful student will be able to solve elementary counting problems, solve systems of linear equations, understand basic facts about classical algebraic structures and apply this knowledge to solving simpler problems of graph theory.

Syllabus

- Basic Counting
- The pigeonhole principle
- Permutations and combinations
- Inclusion-Exclusion
- Systems of linear equations
- Determinants and matrices
- Basic modular arithmetic
- Concrete algebraic structures (permutations as groups; integers and matrices as rings; rational, real and complex numbers as fields; finite fields)
- Simple graphs, directed graphs, weighted graphs
- Trees, spanning trees and forests
- Graph isomorphism

Literature

D. J. Hunter: "Essentials of Discrete Mathematics", Jones and Bartlett Learning, 2017
J. Matoušek, J. Nešetril: "Invitation to Discrete Mathematics", Oxford University Press, 2008
S. G. Krantz: "Discrete Mathematics Demystified", McGraw-Hill, 2009

Weekly teaching load

Lectures: 3	Exercises : 2	Practical Exercises: 0	Student research: 0	Other: **0**

Teaching methodology

Blackboard lectures, Blackboard exercises

Grading method (maximal number of points 100)

Pre-exam obligations	points	Final exam	points
Colloquium 1	**30**	*Oral exam*	*40*
Colloquium 2	**30**		