Level: bachelor

Course title: Graph Theory

Status: elective

ECTS: 6

Requirements: none

Learning objectives

Teaching students to understand and use various results in graph theory, as well as to master the basic algorithms on graphs.

Learning outcomes

Students are expected to understand all of the basic concepts of the graph theory, and to understand standard theorems. They should be familiar with the basic algorithms on graphs, prove complex theorems, be able to comprehend the covered topics as a whole, and solve problems that have not been encountered before.

Syllabus

Theoretical instruction

Graphs and basic graph structures, weighted graphs, search algorithms on trees. Flows in graphs, min-max theorem. Vertex connectivity and edge connectivity. Planar graphs, their basic properties. Stable sets and cliques. Vertex colourings. Matchings, algorithms. Edge colourings. Hamiltonian paths.

Practical instruction

Solving and understanding problems in the mentioned topics in graph theory. Implementation of the standard algorithms for dealing with the mentioned graph structures. Choosing, modifying and implementing algorithms on the way to solution of more complex problems.

Weekly teaching load				Other: 0
Lectures: 2	Exercises: 2	Other forms of teaching: 0	Student research: 0	