

<b>Level:</b> bachelor				
<b>Course title:</b> Discrete Mathematics 2 (I342)				
<b>Status:</b> elective				
<b>ECTS:</b> 6				
<b>Requirements:</b> none				
<b>Learning objectives</b> Acquiring basic knowledge and skills related to the Graph Theory, and learning the basic graph-theoretical algorithms.				
<b>Learning outcomes</b> Students should be able to analyze combinatorial configurations that describe relationships between entities of a system and apply basic algorithms to solving simple real-world problems.				
<b>Syllabus</b> <i>Theoretical instruction</i> Catalan numbers. Partitions, permutations and Stirling numbers of the 1st and 2nd kind. Systems of distinct representatives and Latin squares. Graphs. Eulerian graphs. Hamiltonian graphs. Planar graphs. Colouring vertices and edges of a graph. Digraphs. Weak and strong connectedness. Acyclic digraphs and topological sorting. Tournaments. Weighted graphs.  <i>Practical instruction</i> Catalan and Stirling numbers. Systems of distinct representatives and Latin squares. Graphs as models of systems. Traversing graphs, DFS and applications. Testing algorithmically if a graph is Eulerian or Hamiltonian. Testing algorithmically if a digraph is weakly/strongly connected. Acyclic digraphs and topological sorting. Introductory algorithms on weighted graphs.				
<b>Weekly teaching load</b>				Other: 0
Lectures: 2	Exercises: 3	Other forms of teaching: 0	Student research: 0	