



Dottorato di Ricerca in Ingegneria dell'Informazione

PhD Program in Information Engineering

GRAPH THEORY AND APPLICATIONS

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Abstract: Combinatorial optimization and graph theory have experienced a fast development over the last few decades. It is well known that a lot of problems in combinatorial optimization arose directly from everyday practice in engineering and management. Indeed all the topics considered in this course are motivated by practical interpretations. The goal is to focus on some problems of combinatorial optimization which can be formulated and treated by graph theoretical methods. After an introduction into graph theory, we study some selected topics both from a theoretical and an algorithmic point of view. No previous knowledge of graph theory is necessary.

Monday, 18 May 2020:
Presentation of the course. Preliminary concepts. Eulerian graphs. Examples of applications.

Thursday, 21 May 2020:
Representations of graphs. Optimization problems.

Monday, 25 May 2020:
Matching theory: definitions, properties and main theorems.

Thursday, 28 May 2020:
Matching theory: algorithms.

Monday, 1 June 2020:
Trees and forests: definitions, properties and main theorems.

Thursday, 4 June 2020:
Minimum spanning tree: algorithms.

Monday, 8 June 2020:
Travelling salesman problem: basic definitions, lower bounds, approximation algorithms.

Thursday, 11 June 2020:
Travelling salesman problem: upper bounds via insertion algorithms and local search.

The course will be delivered through asynchronous lessons which will be uploaded on Google Drive on the dates indicated above.

Students interested are requested to contact:

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