
Logistics methods and models

Finalità

This course is aimed at providing students with the basic techniques and algorithms of integer programming and combinatorial optimization as applied to some relevant problems in logistics.

Programma

1. Elements of Integer Programming and Combinatorial Optimization

Review on Linear Programming. Integer Linear Programming: formulation techniques for integer programming problems. Exact algorithms for the solution of integer programming and combinatorial problems: cutting plane methods; branch and bound; dynamic programming. Lower and upper bounds for the optimum: Lagrangian relaxation and Lagrangian duality. Heuristic methods: greedy techniques, local search techniques, improvement heuristics, savings algorithm.

2. Applications to logistics

Location problems: plant and facility location models. Distribution problems: transportation problems; distribution problems; the Vehicle Routing problem; the Travelling Salesman Problem. Scheduling problems.

Attività d'esercitazione

Discussion and solution of exercises and assignments.

Modalità d'esame

Written and oral exam.

Propedeuticità

an introduction to Linear Programming

Testi consigliati

Notes by the instructor.

G.L. Nemhauser, L. A. Wolsey, Integer and Combinatorial Optimization, Wiley.