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# Methods and models for logistics

## 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.