

Models and Algorithms for management and organization

(Modelli e algoritmi per l'organizzazione e la gestione)

Teacher: Fabio Schoen, with part #4 from prof. Marco Sciandrone

Short syllabus:

1. Introduction to optimization models for decision-making.
2. Methods and models for inventory management;
3. methods for production planning;
4. automatic classification
5. Advanced methods and model for production

Textbook: teacher's lecture notes available from the course web site

CFU: 9 (72 hours of lecture)

Aims and scope: Knowing models and algorithms useful for the representation and optimization of managerial problems

Prerequisites: Elementary notions of linear algebra

Extended program:

1. Linear optimization models: linear models, network flows, integer linear programming models, modeling techniques, logical constraints. Outline of solution methods for linear problems
2. Elementary models for inventory management: economic production lot, instantaneous and continuous supply, large quantities discounts, finite horizon models. Stochastic models for inventory management – single period (newsvendor)
3. Models and methods for production planning Model with

deterministic and variable demand; Wagner-Within algorithm, Zangwill algorithm for backorders;

4. Advanced models for production planning; alternative formulations, cutting planes methods
5. Methods and models for the automatic classification
Introduction machine learning techniques. Robust classification robust through support vector machines (SVM)