Logistics

Objectives

The course describes the supply chains operations and functions and the problems related to planning and management of logistics systems, with particular emphasis on optimization problems and on computational techniques to solve them.

Programme

The supply chain

• Terminology and definitions. Description of the supply chain and its main components.

Forecasting

• The problem of demand forecasting. Models and algorithms for demand forecasting. Least squares and simple linear regression.

Inventory management

• Models of inventory systems. Inventory systems with continuous and discrete replenishment. Single-product and multi-product systems. Single-depot and multi-depot systems. Economic order quantity. Scale economies and discount policies. *Production logistics*

• Lot sizing problems. Mathematical models and algorithms.

• Scheduling problems. Mathematical models and algorithms.

Distribution logistics

• Packing problems. Mathematical models and approximation algorithms: first-fit and best-fit. Exact solution with spreadsheets.

• Routing problems. Vehicle routing with additional constraints and heuristic algorithms.

Queuing theory

• Definitions and properties of queuing systems. Modelling, analysis and synthesis of queuing systems. Use of software for queuing theory.

Prerequisites

Operations Research

References

Ghiani, Laporte, Musmanno, *Introduction to Logistics Systems Planning and Control* John Wiley and Sons, New York, 2004.