GIMAS8AF STOCHASTIC MODELS FOR PRODUCTION MANAGEMENT

GIMAS8AF **Stochastic models for production management**	**ECTS Credits:** 2 **Duration:** 21 hours	**Semester:** S8

Person(s) in charge:

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Keywords: uncertainty, inventory control, stochastic models, Markov chains, robust optimization.

Prerequisites: Notions in probability

Objective: Introduction to optimization/evaluation in presence of data uncertainties

Program and contents:

This course deals with optimization problems in production management in presence of data uncertainties. We will study stochastic models, in which the value of the data is not known, but instead a probability distribution is given. Inventory control, where quite often only forecasts of the demand are available, will be presented and used to illustrate different approaches to deal with data uncertainties.

The course starts by an introduction to inventory control theory (usual policies such as reorder point, replenishment, and the deterministic EOQ model). Then, we consider stochastic problems, for a single period (the well known newsboy problem) and for multi-periods, where the expectation of the costs is to be minimized, while satisfying a given quality of service. The course presents exact approaches for simple cases, some heuristics, and some approximations, with a guarantee in expectation. The evaluation of stochastic processes is presented through the simple case of Markov chains (ergodic chain and termination process). The course concludes by presenting some notions of robust optimization, which is another approach to deal with data uncertainties.

Abilities:

Levels	Description and operational verbs
Know	
Understand	
Apply	
Analyze	
Summarise	
Assess	

Evaluation:

☑ Written test	☐ Continuous Control	☐ Oral report	☐ Project	☐ Written report