DA 507 – Modeling and optimization

Meeting Times and Locations
Saturday 9:00 am-12:00 pm
Wednesday 7:00 pm – 10:00 pm

Instructors
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Course Description, Aim and Content
In today’s economy, business professionals make decisions which may vary from day-to-day operations to strategies that influence the future of their companies. Although analytical modeling tools have been out there a very long time, they were typically judged to be useless and cumbersome in the past in the context of business decision making processes. With the advances in computing power, information collection and data processing technologies, analytics has become of very critical interest in this context, and modeling tools have turned out to be essential in implementing analytics.

In this course, we cover various analytical modeling tools with a particular focus on optimization models. Each tool is to be covered to an extent where decision makers will be able to

- identify the necessity of analytical modeling
- realize the use of optimization models in data analytics
- distinguish the type of models that could be used for a particular decision problem
- lead/participate in a team of problem solvers

in the course of business decision making processes.

Examples of modeling and optimization techniques from other courses will be covered. Case studies from real-life businesses will be delivered by professionals who are employing such tools and techniques.

Topics
Decision Making Processes - Analytical Models
Mathematical Programming and Deterministic Models
  Linear programming problems and formulations
  Solution methods for linear programming problems
  Solution interpretation and sensitivity analysis
  Integer programming problems and formulations
  Network problems and network modelling
Stochastic Models
  Stochastic modelling and analysis
  Simulation modelling and analysis
Extensions and Challenges in Decision Making with Analytical Models (tentative)
  Multi-criteria decision making
  Decision analysis
  Data envelopment analysis and analytical hierarchy process
Grading

Assignments (4) 20%
Midterm 30%
Final 50%

References


Announcements and SUCourse

Students are responsible for all announcements made during the regular class meetings. Students should follow the SUCourse site for this class regularly as they are responsible for all announcements and postings on this site.

This document may be modified during the semester (Fall 2014-2015) due to unforeseen reasons.