IE-580: Special Topics (Revenue Management)  
SPRING 2013

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Lecture Hours: Thursday 12:40 pm – 3:30 pm (Location: FENS L062)

Course description: Revenue management is concerned with demand-management decisions faced by any seller of a product or service. Demand-management decisions mainly determine when and where to sell a product, to whom and at what price. Such pricing and capacity-allocation decisions are crucial to manage the demand and maximize the associated revenue. Among the demand-management decisions, we intend to focus on the quantity based decisions and associated control policies that are related to whether to accept or reject an offer to buy, how to allocate the capacity to different products, when to withhold a product and sell at a later point in time, and so on. This course will provide a comprehensive introduction to both the theory and the practice of revenue management. In particular, it will focus on the revenue-based inventory control models, static and dynamic capacity control policies, as well as exact and approximate approaches to solve the revenue optimization problems. In the computational assignments, the students will be given the opportunity to enhance their understanding of the fundamental concepts and to practice implementing the core solution approaches.

Objectives: The main objectives of this course are
• to review the basic concepts, objectives and challenges of revenue management;
• to review the main approaches to formulate and solve the revenue optimization problems;
• to discuss the strengths and weaknesses of the available modeling approaches;
• to familiarize the students with the implementation details of different algorithms for solving revenue management problems.

Prerequisites:
A basic knowledge of probability theory, calculus and optimization. The course should be accessible to the graduate students and advanced senior students from management, engineering and economics.
Course Outline:

- Review of background material
- Introduction to revenue management
- Single-resource capacity control
  - Newsvendor problem
  - Static and dynamic models
  - Heuristics
- Overbooking
  - Issues in airline overbooking
  - Static overbooking models
    - Policies
    - Combined capacity-control and overbooking models
  - Dynamic overbooking models
- Network capacity control
  - The theory of optimal network control
  - Approximations based on network models
  - Approximations based on decomposition
  - Network overbooking
- Discrete-choice models
- Single-Leg Air-Cargo Revenue Management (if time permits)

Reference Books:


Grading:

- Midterm Exam (% 40 of final grade)
- Project (% 40 of final grade)
- Homework + Quiz + Paper Discussions (% 20 of final grade)
Readings (available on SUCourse):


