UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Mathematical Models for Hospitality and Tourism Management

2425-1-F7601M054

Learning objectives

Upon completion of this course, students should gain a good understanding of the main issues in Revenue Management through the use of quantitative models, and learn about the application of such models in practical examples.

Contents

Mathematical models developed for tourism management and focusing in particular on applications in airlines and hospitality industry.

Detailed program

The course program is made by basic topics and ancillary ones, chosen from a list, based on the interest and requests of the students, with the possibility to choose some topics from each argument.
These aspects will be examined to develop the topics

- A description of the practical problem using examples and/or case studies that are relevant for applications
- Mathematical modelling of the problem
- Theoretical explanation of the mathematics that is used for the analysis of the model
- Use of the theoretical tools to solve the model
- The use of computational techniques to implement the solution on the calculator with Excel

Revenue Management objectives and key elements will be the starting point for the program's curse development. In particular, we will introduce and discuss the topic of willingness to pay, demand curve and sensitivity measure to

price variation; optimization of the revenue function; product diversification; optimization with capacity constraints.

The ancillary topics will be chosen among the following ones.

- Quantity based optimization: seat inventory control, booking control, Littlewood model; expected marginal seat revenue (EMSRa e EMSRb) model.
- Price based optimization: dynamic pricing, degree of competition, single and multiple product cases, replenishment.
- Overbooking: features, models and overbooking policies (deterministics, risk-based, service-level, hybrid)
- Network Revenue Management: multi-resource products, heuristics, linear programming, virtual nesting, network bid pricing
- Consumer discrete choice: perfect competition, discrete choice modelling, multinomial logit,
- Markets and Revenue Management: perfect competition, precommitment demand uncertainity, peak-load pricing, monopolistic pricing, price discrimination, oligopolistic pricing

Prerequisites

In this course the knowledge of basic concepts of mathematical analysis and probability are requested.

Teaching methods

Lectures in presence.
The whole 40 hours of lessons consist of dispensing teaching.

Assessment methods

The exam consists of questions about theory and exercises, with a possible oral exam on request. The former test students' knowledge and understanding of the main concepts of the subject. The latter measure students' ability in the application of such concepts to solve simple practical problems.
An intermediate partial exam is planned.
The carrying out of a project that integrates the evaluation is optional and upon request of the students.

Textbooks and Reading Materials

Slides and teaching material at disposal on the couse site

Textbooks

- Talluri, K.T. and Van Ryzin, G.J. "The Theory and Practice of Revenue Management" Springer, 2005.
- Phillips, R.L. "Pricing and Revenue Optimization" Stanford University Press, 2011.

Semester

Second semester

Teaching language

Italian

Sustainable Development Goals