DSC2003 Management Science

Lecturers: A/P Melvyn Sim (Course Coordinator, BIZ2-03-07, 6516 6274)

Session: Semester II, 2009/2010

Prerequisites

Although there are no formal prerequisites, this module assumes prior knowledge of the following probability concepts: Expected value, variance, conditional probability, Bayes’s Rule, Normal distribution, and Poisson distribution.

There are no formal computer programming requirements. However, basic proficiency with Microsoft Excel will be assumed.

Course Objectives

This module is concerned with modeling, analyzing and solving quantitative problems in management. The skills learnt in this module can find applications in fields like finance, economics, operations management, logistics, and engineering.

As an introductory module, we strive for breadth, giving an overview of several practical approaches, as well as sufficient depth, so as to provide a substantial feel for the discipline and a good foundation for further reading. Topics will include linear programming (including spreadsheet solution & sensitivity analysis), integer programming, network flow models, project management, decision analysis, and queuing models.

Course Outline

1. Modelling business problems
2. Linear Programming (LP)--formulation (including transportation model, multiperiod inventory models), graphical analysis, sensitivity analysis, using EXCEL-Solver
3. Integer Programming (IP) --LP vs IP, LP relaxation, binary variables, fixed charge problem, transhipment problem
5. Project Management -- activity list critical path, PERT, CPM, project crashing
6. Decision Analysis -- decision making criteria (maximax, maximin, minimax regret, Hurwicz), decision trees, expected value of perfect information, sequential decision trees.
7. Queueing Analysis -- exponential distribution; basic M/M/1 model, operating characteristics, steady-state results, Little’s Law, finite queue M/M/1/c, multiple server queue M/M/s, M/G/1 queue.

**Main Text**


**Assessment Methods (tentative)**

Assessment will be based on the following:
- Class Participation: 5%
- Mid-Term Test: 45%
- Final Exam: 50%

**Other Information**

- Weekly lectures of 2 hours each, and weekly tutorial sessions of 1 hour each.

**IVLE**

All lecture notes will be posted in IVLE-DSC2003 at least 2 days before the lectures.
All assignments will be posted in IVLE-DSC2003 at least 1 week before the tutorials.
It is up to the individual tutor to decide whether and where he wants to distribute/post answers to problems in assignments.