Introduction to Spreadsheet Optimization and Simulation

Course Description

This course is designed to teach students basic optimization and simulation methods in spreadsheet that are useful in solving decision models. The knowledge and skills introduced are intended to motivate and benefit students in their further study and work in management science and operations research.

The objective of the course is to learn how to formulate mathematical models from decision making problems and analyze and solve the decision models using basic spreadsheet-based optimization and simulation tools. No prior programming experience is necessary to this course. However, we will assume knowledge of basic analysis, linear algebra and statistics. The course outline is as follows:

1. Introduction
   (a) Decision making and modeling
   (b) Mathematical framework

2. Optimization
   (a) Linear programming and applications
   (b) Spreadsheet optimization
   (c) Simplex algorithm and sensitivity analysis
   (d) Convex optimization and integer programming

3. Simulation
   (a) Decision making under uncertainty
   (b) Monte Carlo simulation
   (c) Applications of simulation

Course materials: There is no required textbook for the course. There will be slides and Excel files uploaded on the course website prior to class.

Software: This course will require the use of Windows Excel and we will provide an Excel add-in. This add-in only runs under Windows, so Mac users will need to be able to boot into Windows.
Course Lectures

There are 4 lectures tentatively held in Mudd 303 during the following time slots:

1. Thursday August 24, 2:00–4:15 PM
2. Monday August 28, 2:00–4:15 PM
3. Tuesday August 29, 2:00–4:15 PM
4. Wednesday August 30, 2:00–4:15 PM

Coursework and Grading

There is one optional problem set given at the end of the course. The course has no grading and final exam.

Office Hours

I am generally available in my cubicle (Uris 4X) during the day. You are welcome to stop by without notice if you have short questions. If you have more involved questions or need extensive help, it would be best if you emailed me to make an appointment.