ISOM3710 Business Modeling and Optimization, Spring, 2024

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Lecture   Mon and Wed, 9:00 – 10:20 (L2), 10:30 – 11:50 (L1)

Tutorial   Tue, 12:30 – 13:20 (T2), 16:30 – 17:20 (T1), to start Feb 6

Two Quizzes To be held in class: Mon, Mar 4, and Mon, Apr 8

Short Course Description

Scientific approach to informed decision making and managerial problem solving. Spreadsheet modeling in Excel. The central modeling framework is constrained optimization. Emphases on model building and solution interpretation. Extensive hands-on exercises. Exposure to a wide variety of managerial problems.

Course Materials

- Excel and PDF files downloadable from Canvas.

- *Practical Management Science, 6th Edition, Albright and Winston, 2019*. Softcopy available for purchase. Five hardcopies are at the library reserve for 3-day loan.

Grading

- Two quizzes, 40%. Exam, 60%. Two sections will be graded together.

Study Hints

1. Attend all lectures and tutorials, and treat the in-class exercises seriously.

2. After class, as soon as possible, you should review your notes and redo from scratch the examples covered in class.

3. If you are not familiar with the basics of Excel, you need to work harder to get started. But if you do Steps 1 & 2, you will soon be just fine.

4. I will assign some exercise problems for you to practice on, which will not be graded. I encourage you to work on them. They will be discussed in tutorials and solutions will be posted. It is impossible to do well on tests without working on the exercise problems. Some test problems may be based on them.

Important Policies

1. If you miss a quiz, its weight, 20%, will be shifted to the exam.

2. Attendance is required. You may skip up to three sessions after the add/drop period for personal or other reasons. After that, one point is deducted from the grand total for each class session missed.

Detailed Course Description

This course is about the science and technology of informed decision making. The central theoretical framework is constrained optimization. Spreadsheet decision modeling in Excel is used throughout. The emphasis is on problem formulation, spreadsheet-based solution methods, and managerial insights. Applications to solving managerial decision problems in diverse industries and functional areas will be discussed, including

- Operations Management*: logistics and supply chains management; production planning, airline flight scheduling; supply contracting.*

- Finance and accounting*: breakeven analysis; investment analysis; pension fund planning; portfolio selection, personal financing*

- *Human resources*: workforce scheduling; sales territory assignment and sales-force allocation.

- *Marketing*: Store locations; retail network restructuring retail pricing.

The applicability and use of decision models have increased dramatically in recent years due to the extraordinary improvement in computer, information, and communication technologies. The developments in hardware and user interface, such as spreadsheets, have been complemented by the availability of large volumes of previously unavailable data, such as the automatic capture of point-of-sale information and easy access to large databases. Personal computers and friendly interfaces have become effective "delivery vehicles" for powerful decision models that were once the exclusive province of experts. As information has come to be recognized as a critical resource, decision models play an increasingly critical role in deploying that resource.

The course has a twofold purpose. First, it introduces students to simple models that provide powerful and often surprising qualitative insights about a large spectrum of managerial problems. Second, it gives students a general idea for the kinds of problems that can be tackled quantitatively, the methods and software available for doing so, and the relevant data that needs to be gathered.