

ISOM3710 Business Modeling and Optimization, Fall, 2021

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Tutors	Xingyu FU (xfuai@connect.ust.hk) and Ailing XU (axuaj@connect.ust.hk)
Lecture	Tue and Thu, 13:30 – 14:50 (L2), 15:00 – 16:20 (L1)
Tutorial	Wed, 12:00– 12:50 (T2), 18:00 – 18:50 (T1)

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*. Available for purchase at the bookstore. Three copies are at the library reserve for 3-hour loans.

Grading

- Three quizzes, 40%. (Of the three quiz scores, only two will be included in the final grading -- the lowest will be dropped from consideration.)
- Exam, 60%.
- Each section will be graded separately.

Study Hints

1. Attend all lectures and tutorials, and treat the in-class exercises seriously.
2. After class (and 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 an expert.
4. I will assign some exercise problems for you to practice on, which will not be graded. I encourage you to work on them. Solutions will be posted and some of them will be discussed in tutorial sessions. It is impossible to do well on tests without working on the exercise problems. Some quiz or exam problems may be based on them.

Important Policies

1. I do not give makeup quizzes or exam, and I do not give additional projects to increase your grade before or after the exam.
2. If you miss a test (a quiz or the exam), the score will be 0.

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; airline flight scheduling; airline hub location; process flow management.*
- *Finance and accounting: breakeven analysis; investment analysis; loan portfolio planning; pension fund planning; portfolio selection.*
- *Human resources: workforce scheduling; sales territory assignment and sales-force allocation.*
- *Marketing: allocating marketing expenditures; 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.