BZAN 7320: Business Modeling for Competitive Advantage
Section 21635   Thu 6 – 9   Spring 2016

Instructor: Ming Zhao, PhD
Student Hours: Tue/Thu 4:00 – 5:00 p.m. and by appointment
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I.   Course Description

Data have become a torrent flowing into every area of the global economy. Many companies are seeking to enhance their ability to transform data into valuable insights and actions. This course will provide students with necessary skills, including mathematical modeling, forecasting, optimization and simulation, and inspiring learning experience of being a project manager, who can

- Communicate between business people and technicians
- Identify and scope business problems
- Select related techniques, develop simple demos and present business impact
- Oversee technical projects and provide business guidance
- Perform knowledge transfer and present analytical insight

The course will emphasize on scoping the problem (i.e. identify the business opportunities) and developing analytic insights. Besides providing necessary technique training, the course will offer opportunities for presenting, communicating and experiencing the full analytic process.

II. Prerequisite

Students are expected to be proficient in Excel prior to taking this course. This included being able to use common Excel tools such as range names, pivot tables, data tables, lookups, goal seek, conditional/logical IFs, conditional SUM/COUNT/AVERAGE, SUMPRODUCT, and statistical and financial functions. A good tutorial on all these tools (and more) can be found here: http://www.kelley.iu.edu/albrightbooks/Free_downloads.htm

Students are expected to have intermediate algebra proficiency.

III. Textbook, computer and software requirements

Textbook: *Practical Management Science 5th ed.,* ISBN 978-1-305-25090-1 (hardcover version). The 4th edition of the U.S. textbook is also acceptable, but do not purchase the international edition because the chapter contents and some of the problems are different. We are also working with the publisher to provide a lower cost version.

Additional requirements:
- Laptop computer with Windows 7/8 OS (XP/Vista acceptable, but not recommended). Because of issues with the Excel add-ins, **Mac users must be able to run Windows** as the native OS or via Boot Camp, etc.
- Microsoft Access/Excel 2010/2013 for Windows (sorry, no earlier versions) and PowerPivot for Excel
- *Licensed version* of Palisade Decision Tools Suite and other Excel add-ins (included with *new* textbooks)
- Optional: SAS, JMP, R.

IV. Course Design

The course involves lots of Excel Spreadsheets modeling. To be successful in this course you should be prepared to spend a fair amount of time outside of class practicing your modeling skills. This course is taught using inverted pedagogy where you are responsible for reviewing the course lectures online BEFORE coming to class so that we can work more challenging problems during class and have more time for discussion.

The course will include many case studies and assigned readings, which are papers from *Interfaces*, *Harvard Business Review*, *INFORMS transactions on Education*, etc. Students should plan to work on the case studies in self-determined teams of two or three. During the semester, each team will get at least one chance to present in class.

The course will have one major case study assignment, which is on a real-life project. At the end of the semester, each team need to provide

- Meeting minutes
- Slides for 20 minutes presentation
- Statement of work
- An Excel based demo

Three open-book exams will be administered outside of class time. DO NOT assume that because the exams are open-book that you can simply "look up" the answers. Rather, you need to be able to work the problems on your own and only use the book as a reference. The exams are not comprehensive, although they do build on your prior modeling skills.

Your grade in this class will be earned as follows: 60% exams, 30% major case study, 10% in class presentation, 5% bonus for class participation; refer to the detailed syllabus posted on BlackBoard for grade scale and more information.

V. Teaching Philosophy and Classroom Conduct

My teaching philosophy is based on the goal of helping students to experience the analytic world and closing the gap between what you know and what you can do. I believe that education should be more than learning the contents of the textbooks. Students must understand and articulate the knowledge they gain before they can apply it successfully. This course will be particularly challenging in that regard, but you will benefit from it immensely.

All students are expected to behave in a professional and ethical manner at all times. This includes, but is not limited to, the following:

- Coming to class on time and staying until the end of the period. "Attending" class means not only being physically present but also engaged and actively participating in a positive way.
- Using legally licensed copies of the course software and textbook materials.
- Using your computer for class business ONLY; i.e., ***not for email, web surfing, messaging, etc.***
- Taking notes and paying attention during class so that you can ask meaningful questions.
- Working diligently outside of class time to solve the homework problems on your own.
- Strictly observing the university academic honesty policy at all times.

VI. Class schedule

The following is a *preliminary* schedule for the semester; the instructor reserves the right to modify the schedule as events warrant:

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Tentative Class Schedule Spring 2016

Week	Date	Topic	Sections
1	Jan. 21	Course Introduction, Excel Fundamentals	Excel tutorial (listed in prerequisite)
2	Jan. 28	Advanced Excel Skills, Work Flow of Business Analytics	Excel tutorial and class notes
3	Feb. 4	Regression and forecasting	Ch. 14
4	Feb. 11	Modeling process	Ch. 3
5	Feb. 18	Linear optimization	Ch. 4
5	Feb. 19	Assessment #1	
6	Feb. 25	Binary (integer) optimization	Ch. 5,6
7	Mar. 3	Nonlinear optimization	Ch. 7
8	Mar. 10	Genetic algorithms	Ch. 8
9	Mar. 17	**SPRING BREAK**	
10	Mar. 24	Decision models	Ch. 9
10	Mar. 25	Assessment #2	
11	Mar. 31	Intro to Monte Carlo simulation	Ch. 10
12	Apr. 7	Intro to @Risk	Ch. 10
13	Apr. 14	Simulation models	Ch. 11
14	Apr. 21	Supply chain model	Ch. 12
15	Apr. 28	Advanced topics	
15	Apr. 29	Assessment #3	

* Exams are administered online over weekends, generally during a window from 6 pm Friday – midnight Sunday.   *Revised:* **3/27/2015**

Note: The University of Houston academic calendars are published a year in advance, and show the date of finals week and the end of the semester. Travel plans prior to the end of the semester can not be used as a reason to request a makeup exam.