Business Modeling for Competitive Advantage
M-F January 8-15, 2016, 9:00am-1:00pm

Prof. James D. Hess
375H Melcher Hall
jhess@uh.edu
Cell phone 713 702-8460
Off. Hrs. TBA

COURSE DESCRIPTION AND OBJECTIVES

Businesses face a multitude of management problems that cannot be effectively solved by seat-of-the-pants thinking: incremental breakeven analysis, sales forecasting, deployment of personnel, rating subunit effectiveness, inventory management, customer lifetime value contests, or sales territory design. The purpose of this course is to provide students with an advanced level of analytical skills that will enable them to examine business problems by developing models, analyzing alternatives, and recommending solutions using modern spreadsheets. Among the spreadsheet techniques we will study are: optimization, risk analysis, data analytics, and forecasting. In each area we will consider specific operations, finance and marketing illustrations.

Learning Objectives
- To build your knowledge of a variety of business management problems.
- To develop your ability to diagnose decision relevant information for business decisions.
- To increase your analytical skills and to expose you to several commonly used 'advanced' modeling techniques that help improve firm profitability.
- Develop experience building computer spreadsheets to facilitate management.

We will accomplish this through lectures, computer exercises, and discussion of business cases that cover a wide range of realistic business decisions.

REQUIRED COURSE MATERIAL

This is a computer intense class. Please bring your PC Windows laptop to class. Apple Mac computers do not work for some of the advanced Excel, so only PC Windows-based computers are allowed in this course. If you do not have or cannot borrow a PC Windows laptop, contact the professor immediately.

1. **Readings**: An abbreviated, less expensive version of Practical Management Science, 4th ed, by Winston and Albright will be used, custom ISBN 9781305310438. *This is a loose leaf, 3 hole drilled, shrink wrapped custom text including the Preface, Chapters 2, 3, 7, 10 and 12 with Premium Online Access Card included. The instructions for accessing the online access are detailed in the Preface.*
2. **Cases**: Each time the class meets, there will be cases related to business decisions and modeling to discuss. To minimize your time demands, the cases will be distributed, read and analyzed in class.
3. **Software**: Computer applications will use EXCEL 2010 or later for Windows (**not** Apple Mac).

Activities

Case Discussion: To keep the classroom lively, all sessions will include a discussion of at least one case. This wonderful opportunity to practice presenting and discussing business issues from an analytic perspective. Teams will be assigned one case as a "primary" discussion leader or one case as a "secondary" discussion leader. For each case discussion, a student will receive a grade of

> 5= Extraordinary contribution to the discussion
> 3= Relevant contribution to discussion.
> 1= Minor contribution to the discussion
> 0= Lack of contribution to discussion.

Note: if for any reason you cannot make it to class, you may do a write-up of a case from another session in lieu of class participation that you missed. This will not count as one of your two case write-ups mentioned below, but rather as a partial substitute for class attendance.

Case Write-ups: Please select two of the cases and after the class discussion submit a one page executive summary of your recommendations, along with the spreadsheet that you developed to analyze the problem. The spreadsheet could have been developed within your team, but the write up should be done independently. If you think you could do better than one of your first two write-ups, you may do a third to substitute for the disappointing one. Write-ups are due within a two classes of the discussion; send as an email attachment to jhess@uh.edu.

Term Project: It is common practice for a firm to develop an operational version of a model created by academic researchers or to use it as the basis for consulting practice. To simulate this practice, each team will build an Excel-based business model that operationalizes a published model. As a marketing scientist, I am therefore more familiar with the following.

1. Campbell, Deb, Randy Erdahl, Doug Johnson, Eric Bibelnieks, Michael Haydock, Mark Bullock, Harlan Crowder, (2001), "Optimizing Customer Mail Streams at Fingerhut," Interfaces 31(1):77-90.
2. Neslin, Scott and Robert Shoemaker (1983), "A Model for Evaluating the Profitability of Coupon Promotions," Marketing Science, 2: Fall, 361-388.
3. Hanson, Ward, Kipp Martin (1990), "Optimal Bundle Pricing," Management Science, 36, (Feb), 155-174. See a description in Eppen, Gary, Ward Hanson, and Kipp Martin (1991), "Bundling - New Products, New Markets, Low Risk," Sloan Management Review, Summer, 7-14.
4. Swami, Sanjeev, Josh Eliashberg and Charles Weinberg (1999), "SilverScreener: A Modeling Approach to Movie Screens Management," Marketing Science, 18(3), 352-372.
5. Eliashberg, Jehoshua, Jedid-Jah Jonker, Mohanbir S.Sawhney, Berend Wierenga (2000), "MOVIEMOD:An Implementable Decision-Support System for Prerelease Market Evaluation of Motion Pictures," Marketing Science, 19(3), 226-243.

However, your team is free to choose other papers on business topics that interest you. Each year the Institute for Operations Research and the Management Sciences (INFORMS) has a research competition for applications of business models called the Edelman Award (https://www.informs.org/Recognize-Excellence/Franz-Edelman-Award). Each year the first issue of Interfaces publishes the winner and finalists papers. You can view these issues of Interfaces via the UH library webpage (http://info.lib.uh.edu/).   Some examples are:

6. "MISO Unlocks Billions in Savings Through the Application of Operations Research for Energy and Ancillary Services Markets," Carlson, Chen, Hong, Jones, Larson, Ma, Nieuwesteeg, Song, Sperry, Tackett, Taylor, Wan, and Zak, Interfaces 201242:1, 58-73.
7. "Optimizing Chevron's Refineries," Kutz, Davis, Creek, Kenaston, Stenstrom, and Connor, Interfaces 201444:1, 39-54.
8. "Optimizing Ship Routing to Maximize Fleet Revenue at Danaos," Varelas, Archontaki, Dimotikalis, Turan, Lazakis, and Varelas, Interfaces 201343:1, 37-47.
9. "Norske Skog Improves Global Profitability Using Operations Research," Everett, Philpott, Vatn, and Gjessing, Interfaces 201040:1, 58-70.
10. "Operations Research Advances Cancer Therapeutics," Lee and Zaider, Interfaces 200838:1, 5-25.

Each team member will independently provide a written explanation of team's spreadsheet and the team will make a presentation to class.

Examinations: No exams.

GRADING   At the end of the course your accumulated points will be "z-scored" in comparison to others. Case Discussion 30%, Case write-ups 20%, Term Project Spreadsheet and Explanation 40%, Project Presentation 10%.

Schedule of Topics

Day	Topics	Readings	Excel	Cases	
1. M Jan 4	Modeling Business Problems	2.1-2.4	Intro to Excel, GoalSeek Scatterplot with Trendline	O'Farrior Incremental Breakeven	Nespresso Milk Frother: Bass Diffusion
2. Tu Jan 5	Response models, Optimization	8.6, 7.1-7.4, Optical Distortion*	Solver	Response to Chicken Contact Lense Price	
3.W Jan 6	Constraints, Linear Programming	3.1-3.5	Evolutionary Solver, Simplex LP	Callplan at UNILAB	Territory Design: Blue Bell Ice Cream
4. Th Jan 7	Regression, Conjoint	Winston Chapter 16	Excel Data analysis	Hilti: purchase model	HOBBICO conjoint
5. F Jan 8	Targeting Customers	Winston Chapter 17	Logit	Puritan Bennett targeting	*Review potential project topics*
6. M Jan 11	Competition	Dixit and Nalebuff	Excel Macros	Liquid Dietary Supplements product design	*Project Lab*
7. Tu Jan 12	Inventory Management	10.5, 12.5-12.6	@RISK	Ebony Bath Soap	*Project Lab*
8. W Jan 13	Portfolio Simulation	Notes on Portfolios	@RISK	Can the Portfolio Outperform the Angel of Death?	*Project Lab*
9. Th Jan 14	Event Response	Exponential Smoothing, Seasonality from Wiki	Exponential smoothing, Seasonality	Ecolab's Sales Contests	*Project Lab*
10. FJan 15	Project presentations			*Project Lab*	Presentations

*   Purchase <u>Optical Distortion</u> from Harvard Business Publishing by clicking link https://cb.hbsp.harvard.edu/cbmp/access/42187431

Blackboard Learn We will use the Blackboard Learn system as a bulletin board to facilitate electronic communication. On our BZAN 7320, we will post background readings, datasets, lecture notes, and links to video lectures. You can log onto Blackboard from any computer that has Web access to http://www.uh.edu/blackboard/ .

Academic Honesty: The University of Houston Academic Honesty Policy is strictly enforced by the C. T. Bauer College of Business. No violations of this policy will be tolerated in this course. A discussion of the policy is included in the University of Houston Student Handbook, http://www.uh.edu/dos/hdbk/acad/achonpol.html. Students are expected to be familiar with this policy.

Accommodations for Students with Disabilities: The C. T. Bauer College of Business would like to help students who have disabilities achieve their highest potential. To this end, in order to receive academic accommodations, students must register with the Center for Students with Disabilities (CSD) (telephone 713-743-5400), and present approved accommodation documentation to their instructors in a timely manner.

Learning Goals: 1. Communication - Students will demonstrate effective written and oral communication skills. How? Case presentations/writeups and project report.2. **Cross-Disciplinary Competence** - Students will demonstrate the ability to integrate different functional areas in solving business problems. How? Cases and project..3. **Critical Thinking** - Students will demonstrate the ability to analyze business situations and recommend appropriate actions. How? Cases and project.