BZAN 7320

Business Modeling for Competitive Advantage

January 2-13, 2023, 6-8pm

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

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 skills for evidence-based management by developing models, analyzing alternatives, and recommending solutions using modern spreadsheets. Evidence-based management is built on three types of models: optimization models, statistical models, and simulation models. In each type we will consider specific accounting, 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 evidence-based management.

We will accomplish this through video 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. I use Windows Excel 2016 and 2019, but other versions of Windows Excel usually work fine. Past experience tells me that Apple Mac computers sometimes have glitches with advanced Excel. Having no experience with Apple Macs, if you have problems I cannot help much.

1. **Zoom Online Classes** For your health, this course will be taught synchronously online this semester. That is, M-F, 6-8 pm, we will all meet in a Zoom video conference. These session will be case analysis and discussion; the lectures will be recorded videos (see next numbered comment). Expect an email from me, telling you about our first Zoom meeting.
2. **Video Lectures**: prior to coming to class, it will be assumed that you have studied the video lectures that explain the material; no class time will be devoted to repeating this material. Links to these video lectures are found on Blackboard Learn.
3. **Readings**: The textbook is Wayne Winston and Christian Albright's *Practical Management Science 6th ed.*, which can be rented from at Amazon.com for about $37. This is an all-encompassing 900 page book, however, recognizing that you are time constrained, we will use only a proportion of it to supplement video lectures.
4. **Cases**: Each time the class Zooms, there will be a case related to business decisions and modeling based upon the video lectures. Read the case before class, but save your time, there is no need to do analysis until the class time – this is a team effort.
5. **Software**: Computer applications will use EXCEL for Windows.

Activities

Case Discussion: To keep the classroom lively, all sessions will include discussions of a business case. This great opportunity to practice presenting and discussing business issues from an analytic perspective. Teams will be assigned one case as a "primary" discussion leader and one as a "secondary" leader.

Case Write-ups: Please select **three** of the **nine** cases and after the class discussion submit a **two page double-spaced** 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. The write up is purely your "recommendation;" I expect you to cite specific parts of your spreadsheet (rather than cutting and pasting tables into the write up) to backup your ideas. Write-ups are due before the next class; 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. Your team will be assigned one of the following models.

1. Swami, Sanjeev, Josh Eliashberg and Charles Weinberg (1999), "SilverScreener: A Modeling Approach to Movie Screens Management," Marketing Science, 18(3), 352-372.

2. "Optimizing Chevron's Refineries," Kutz, Davis, Creek, Kenaston, Stenstrom, and Connor, Interfaces 2014, 44:1, 39-54.

3. "Optimizing Ship Routing to Maximize Fleet Revenue at Danaos," Varelas, Archontaki, Dimotikalis, Turan, Lazakis, and Varelas, Interfaces 2013, 43:1, 37-47.

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. Yippee!

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

Blackboard Learn We will use the Blackboard Learn as a bulletin board to facilitate electronic communication. You can log onto Blackboard Learn from any computer that has Web access to http://www.uh.edu/blackboard/**.**

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.

Bauer Code of Ethics

1. Bauer students shall maintain the standard of academic honesty set forth under the University of Houston's Academic Honesty Policy http://publications.uh.edu.
2. Bauer students shall respect other students, faculty, staff and the Bauer environment.
3. Bauer students shall maintain individual accountability and integrity.

Please be aware that students who engage in actions prohibited by the Bauer Code of Ethics will be subject to disciplinary action and may not receive credit for the course.

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS (www.uh.edu/caps) by calling (713) 743-5354 for routine appointments or if you or someone you know is in crisis. There is no appointment necessary for the "Let's Talk" program, a drop-in consultation service at convenient locations and hours around campus. Visit www.uh.edu/caps/outreach/lets_talk.html for more information.

Excused Absence Policy

Regular class attendance, participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of Houston Undergraduate Excused Absence Policy and Graduate Excused Absence Policy for reasons including: medical illness of student or close relative, death of a close family member, legal or government proceeding that a student is obligated to attend, recognized professional and educational activities where the student is presenting, and University-sponsored activity or athletic competition. Additional policies address absences related to military service, religious holy days, pregnancy and related conditions, and disability.

Recording of Class

Students may not record all or part of class, livestream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor. If you have or think you may have a disability such that you need to record class-related activities, please contact the Center for Students with DisABILITIES. If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Classes may be recorded by the instructor. Students may use instructor's recordings for their own studying and notetaking. Instructor's recordings are not authorized to be shared with *anyone* without the prior written approval of the instructor. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.

Syllabus Changes

Due to the changing nature of the COVID-19 pandemic, please note that the instructor may need to make modifications to the course syllabus and may do so at any time. Notice of such changes will be announced as quickly as possible through (*specify how students will be notified of changes*).

Synchronous Online Courses:

This course is being offered in the Synchronous Online format. Synchronous online class meetings will take place according to the class schedule. There is no face-to-face component to this course. In between synchronous class meetings, there may also be asynchronous activities to complete (e.g., discussion forums and assignments). This course will have a final exam per the University schedule. The exam will be delivered in the synchronous online format, and the specified date and time will be announced during the course. Prior to the exam, descriptive information, such as the number and types of exam questions, resources and collaborations that are allowed and disallowed in the process of completing the exam, and procedures to follow if connectivity or other resource obstacles are encountered during the exam period, may be provided.

Helpful Information

COVID-19 Updates: https://uh.edu/covid-19/
Coogs Care: https://www.uh.edu/dsaes/coogscare/
Laptop Checkout Requests: https://www.uh.edu/infotech/about/planning/off-campus/index.php#do-you-need-a-laptop
Health FAQs: https://uh.edu/covid-19/faq/health-wellness-prevention-faqs/
Student Health Center: https://uh.edu/class/english/lcc/current-students/student-health-center/index.php

Schedule of Topics, Readings and Videos

Day	Topics	Readings	Excel	Case	Videos (studied before class meetings)
1. M Jan 2	Intro to Excel, GoalSeek Scatterplot with Trendline	1, 2.1-2.4, 2.6, 2.Appendix	Intro to Excel GoalSeek Scatterplot with Trendline	O'Farrior Incremental Breakeven	Course Introduction Excel Training Videos Constructing a Spreadsheet Term Projects Array Formulas Visual Basic Macros Breakeven Analysis Response Models Scatterplots Building Excel Skills 1
2. Tu Jan 3	Optimization via Solver	7.1-7.4, 8.6 Optical Distortion*	Solver	Chicken Contact	Optimization Solver Calibrating response models
3.W Jan 4	Allocating Human Resources	3.1-3.5	Constrained Optimization via Solver	Optimal Auditing	Constraints and CALLPLAN model Building Excel Skills 2
4. Th Jan 5	Shortest Paths	5.5	Advanced VBA Macros	Dr. Pepper Travel	Shortest Path Problem
5. F Jan 6	Simplex LP	4.1-4.2, 4.8	Simplex LP	Efficient Bank Branches	Linear Programming of Ad Media Plan Territory Design Models Building Excel Skills 3
6. M Jan 9	Competition	Dixit and Nalebuff	Evolutionary Solver	Liquid Dietary Supplements	Competition and Game Theory Game Theory via Excel Macros
7. Tu Jan 10	Excel regression	13.1-13.4	Excel Data Analysis	Hilti	Regression Analysis
8. W Jan 11	Simulation	10.5, 12.4-12.6	Random Draws in Excel	Ebony Bath Soap	Economic Order Quantity Inventory Model Simulation in Excel
9. Th Jan 12	Portfolio Simulation	Notes on Portfolios		Can your Portfolio Outperform the Angel of Death?	Portfolio Analysis
10. F Jan 13	Projects			Presentations	

* Purchase Optical Distortion from Harvard Business Publishing by clicking link https://hbsp.harvard.edu/import/1002833