BUS 735: Business Decision Making and Research
Instructor: James Murray, Ph.D.
Fall 2010

Instructor Information

James Murray, Ph.D.
Office: 403W Wimberly Hall
Phone: 608-406-4068
Email: murray.jame@uwlax.edu

Meeting Time / Location

Thursdays 5:30pm - 9:15pm, Room 7 Wing Communication Center.
We have a special scheduled class meeting on Tuesday, November 23, 5:30pm - 9:15pm.
No class on Thursday, November 25, 5:30pm - 9:15pm.

Course Description (From Graduate Catalog)

This course introduces a variety of quantitative and qualitative methods that support business decision-making and research. These methods range from quantitative approaches like multivariate analysis, simulation and linear programming to qualitative approaches that use unstructured forms of data collection, both by interviewing and observation. Students will achieve conceptual understanding of the research methods covered in the course and acquire hands-on experience in applying these methods to practical business situations and business research while using computer-based tools. Prerequisite: successful completion of the foundation requirements.

Learning Objectives

For successful learning, it is important that you understand why we do the reading, lectures, assignments, etc, we do. Everything we do in this class is meant to achieve the learning objectives below. It would be useful for you to pay careful attention to what learning objectives the lectures and assignments are meant to achieve.

1. Be able to construct and test hypotheses using a variety of bivariate statistical methods to compare characteristics between two populations.

2. Be able to construct and use multiple regression models (including some limited dependent variable models) to construct and test hypotheses considering complex relationships among multiple variables.

3. Be able to construct and use analysis of variance and analysis of covariance models to construct and test hypotheses considering complex relationships among multiple variables.

4. Be able to construct and solve linear programming models to answer business optimization problems.

5. Be able to use stochastic operations research models to answer business questions that involve uncertainty.

6. Be able to use standard computer packages such as SPSS and Excel to conduct the quantitative analyses described in the learning objectives above.

7. Have a sound familiarity of various statistical and quantitative methods in order to be able to approach a business decision problem and be able to select appropriate methods to answer the question.

Course Resources

Statistics Textbook: Abu-Bader, Soleman H. (SHAB) (2010) *Advanced & Multivariate Statistical Methods for Social Science Research (With a Complete SPSS Guide)*.

Management Science Textbook: Taylor, Bernard W. (BWT) (2010) *Introduction to Management Science* 10th Edition.

Computer Software: You will need to use SPSS (Statistical Package for the Social Sciences) and Microsoft Excel throughout the semester. SHAB describes how to conduct various statistical methods for SPSS Version 18, however, previous versions 17 and 16 should be very similar. SPSS Version 18 is install in all GCA (General Computing Access) computer labs across campus. UW-L Technology Services also sells SPSS Version 18 for a reduced price ($199) if you want to install it on your home computer.

Office Hours

Regular office hours are 2:30pm-3:30pm Mondays and Wednesday and Tuesdays and Thursdays 4pm-5pm. These are times when you can drop by unannounced and expect me to be in my office. If you would like to make an appointment for a different time, please check my calendar and send me an e-mail. Frequently keeping up with the material usually requires frequent office visits, so I feel frequently coming to my office for questions is essential to your success.

Office hours are not a substitute for attending class. Except when missing class for very extreme circumstances that were promptly discussed with me, it is not acceptable to use office hours to ask questions about material you missed while not in attendance.

Outside of my regularly scheduled classes and office hours, my availability changes all the time. You can visit my calendar at `http://www.murraylax.org/calendar.html`. It is constantly updated.

Assessment

Learning will be assessed with the following assignments.

1. Homework / In-class exercises

2. Take Home Exam 1

3. Take Home Exam 2

4. Final Project

The weights for each category will be chosen to maximize the average grade in the class, subject to restriction that the each category cannot exceed twice the weight of any other category. The weights are therefore determined by the linear programming problem below.

Optimal Grade Weights

Let $x_{i,j}$ denote individual i's score on category j (one of the four categories above), let n denote the number of people in the class, and let w_j denote the weight towards the final grade for category j. The weights will be chosen to solve:

$$\max_{w_j} \frac{1}{n} \sum_{i=1}^{n} (w_1 x_{i,1} + w_2 x_{i,2} + w_3 x_{i,3} + w_4 x_{i,4})$$

Subject to:

$$(1) \sum_{j=1}^{4} w_j = 1$$

$$(2) \ w_j \leq 2w_k \ \ \forall_{j \neq k}$$

Grade Breakdown

93-100	A	67-76	C
89-92	AB	57-66	D
81-88	B	0-56	F
77-80	BC		

I reserve the right to scale every person's grade up by the same amount on any graded item in the event that much of the class falls short of the scale above. However, even if the grades are significantly low, there is no guarantee that I will ever do this.

Homework Assignments / In-class Exercises

Homework assignments will be given almost every week to give you experience using the quantitative methods that we learn each week. Most of the homework assignments will involve problems in your textbooks and all of them will require you to use SPSS and/or Microsoft Excel. *All written answers for homework assignments must be typed. Handwritten answers will not be accepted.*

In-class exercises will involve problems similar to your homework assignments, and will most often be your first exposure to using the techniques we learn in the class. They will often, but perhaps not always, be done in groups. You may use your textbooks and notes for the in-class exercises.

Exams

There will be two take home exams that will include quantitative analysis / problem solving questions questions similar to your homework assignments and in-class exercises. The exams will be more difficult however, because they will involve the often difficult problem of choose what methods are appropriate for answering a particular question. Plan to spend between 5 to 10 hours working on each exam (this should not be interpreted as a guaranteed time to completion). *All written answers for the exam must be typed. Handwritten answers will not be accepted.* The exams are due on the following dates:

- Take Home Exam 1 is due in class at 5:30pm on **Thursday, October 28**.

- Take Home Exam 2 is due in my office, 403W Wimberly Hall, at or before 5:00pm
  on **Friday, December 17**.

Project

Projects must be done in groups of 3 or 4 students. The projects will involve finding or collecting data, identifying a business or research question to answer, and using the quantitative methods learned in this class to answer the question. The research question must be also motivated by a short literature review. You will not need to write a formal paper, but you will need to present the project to the class on the last day of class, and provide a short summary (approximately 2 pages) to me and your classmates during the presentation. The summary should include an abstract, a summary of relevant literature (perhaps a bulleted list), a description of the dataset and methods used, and your statistical outcomes and conclusions of the study.

Deadlines for the project:

- On Thursday, September 16 I will put you into randomly chosen groups (like the real world, you don't have a choice who have to work with).

- On Thursday, September 30, identify a dataset or construct a plan to collect data, and provide a title and one-sentence thesis statement for your project.

- On Thursday, November, 4, e-mail me your dataset to confirm you have the data you need to go forward with your project.

- On Tuesday, November 23, type up and turn in some results and descriptions of your quantitative analysis.

- Thursday, December 9, Final presentations.

Attendance

Attendance is required to receive credit for in-class exercises. However, if you need to miss a class day or exam day because of illness or emergency you can be excused and arrangements can be made for you to make up missed word. If you need to leave class early, as a courtesy please let me know before class.

E-mail Guidelines

I insist on the following e-mail etiquette rules (many of these are also recommended by the College of Business Administration). Failure to adhere to these guidelines will result in a reply with a friendly reminder to follow these e-mail guidelines.

- Questions sent by e-mail should be able to be answered with only a few words, such as 'yes' or 'no' questions. Questions whose answers involve explaining class material are not appropriate over e-mail. For answers to these questions you should come to office hours, or send an e-mail requesting we meet at a different time.

- Always include a subject that is brief but still has sufficient detail.

- Look at your class notes and syllabus before sending an e-mail. Do not ask a question whose answer is on the syllabus or announced in class (unless you missed class for a legitimate reason).

- Always spell check, grammar check, and re-read your e-mail before sending it.

- When requesting to meet with me outside of regularly scheduled office hours, consult my calendar (http://www.murraylax.org/calendar.html) and suggest a time we meet in your first e-mail correspondence.

Classroom Behavior

Please adhere to these behavior guidelines:

- No using mobile phones, PDAs, smart-phones, or other personal electronics during class (i.e. no text messaging, e-mailing, or surfing the web with mobile phones). If you do text message during class, you agree to give me the right to take your phone for the remainder of the class, and write my own text message from your phone to whomever you were communicating with.

- Please refrain from talking to those around you when I or one of your classmates is talking to the whole class. Even if you have a quick question like, "What did he just say?" do not whisper the question to your neighbor. Instead ask me.

Disabilities

Any student with a documented disability (e.g., physical, learning, psychiatric, vision, or hearing, etc.) who needs to arrange reasonable accommodations must contact the instructor and the Disability Resource Services office (165 Murphy Library, 785-6900) at the beginning of the semester. Students who are currently using the Disability Resource Services office will have a copy of a contract that verifies they are qualified students with disabilities who have documentation on file in the Disability Resource Services office. It is the student's responsibility to communicate their needs with the instructor in a timely manner.

Academic Dishonesty

I follow the policy stated University Academic Handbook with regard to cheating and academic dishonesty. The student handbook can be found online at `http://www.uwlax.edu/studentlife/eagle_eye.htm`. In the event a student is caught cheating I will pursue the harshest penalty that the University will allow, regardless of how small the offense may appear.

Preliminary Topics Schedule

Below is a list of topics and readings for this class. This is a preliminary schedule; depending on time constraints and the topics the class finds most interesting, we may choose to not cover some of the items below, cover items that are not shown below, or re-arrange the schedule. Details about the dates these topics are covered will be posted on the calendar on the class website,
http://www.murraylax.org/bus735/calendar.html

Module 1: Statistical Analysis using SPSS / Elementary Statistical Methods

1. Introduction to Using SPSS
2. Bivariate statistics.
   - **Required reading:** SHAB, Chapter 1.
3. Linear Regression
   - **Required reading:** SHAB, Chapter 3.
4. Multiple Regression.
   - **Required reading:** SHAB, Chapter 4.

Module 2: Multivariate Analysis

1. Logistic Regression
   - **Required reading:** SHAB, Chapter 5.
2. Two-Way Analysis of Variance (ANOVA)
   - **Required reading:** SHAB, Chapter 6.
3. Two-Way Analysis of Covariance
   - **Required reading:** SHAB, Chapter 7.
4. Repeated Measures ANOVA
   - **Required reading:** SHAB, Chapter 8.

Module 3: Decision Making with Uncertainty

1. Elementary Forecasting
   - **Required reading:** BWT, Chapter 15.
2. Probability Distributions and Decision Analysis.
   - **Required reading:** BWT, Chapters 11, 12.
3. Simulation
   - **Required reading:** BWT, Chapter 14.

Module 4: Optimization Problems

1. Linear Programming, Sensitivity Analysis.
   - **Required reading:** BWT, Chapters 2,3.
2. Transportation / Assignment models.
   - **Required reading:** BWT, Chapter 6.
3. Network Models, Project Management
   - **Required reading:** BWT, Chapters 7,8.