LIR 832: QUANTITATIVE METHODS FOR HUMAN RESOURCE AND LABOR RELATIONS
Fall, 2008
Monday, 6:00pm - 8:50pm: East Lansing
Thursday, 6:00pm - 8:50pm: Troy
Discussion/Lab Sessions: TBA

Instructor: Dale Belman
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Office Hours: Tuesday: 1:30pm - 3:00pm or by appointment

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Course web site: www.msu.edu/course/lir/832/

Students with disabilities needing accommodations for examinations or other assignments should discuss their requests with the instructor as soon as possible.

Course objectives:

This course is divided into three sets of skills, each with separate objectives.

1. Statistical Analysis: The application of multi-variate techniques to determine underlying social relationships. This will focus on developing a theoretical and practical understanding of the application of regression techniques.

2. Application of Techniques in Practical Situations: Although theoretic understanding of multi-variate techniques is a necessary foundation for knowledgeable use of statistical techniques, practical experience in their application is also important. Students will develop familiarity with statistical software, multi-variate techniques, methods of testing hypotheses and diagnostic methods.

3. Evaluation of Research: Good research is founded on mastery of statistical theory, but requires careful framing of issues, consideration of appropriate measures and specification and interpretation of the results of statistical tests. Students will learn to read statistical articles and evaluate the results of that research.
Pre-requisites: LIR 832 has two pre-requisites, an undergraduate statistics course and taking the statistical assessment. Students must have taken an undergraduate course in statistics prior to enrolling in LIR 832. Students must also take an assessment of their statistical knowledge. Those who pass, typically a score of 75 or better, have a solid foundation of knowledge in statistics and are ready for LIR 832. Those who score below 75 may find the course challenging as the course assumes a working knowledge of undergraduate statistics. It is recommended that those scoring under 75 take the non-credit Fundamentals of Statistics, an on-line refresher course. Fundamentals of Statistics provides practice with the concepts needed for LIR 832 and prepares the student for learning about human resource methods and metrics.

Grade Determination: You will be evaluated on the basis of two examinations, problem sets, and written assignments. Assignments are described in detail in the assignment sheet. The weights given to the assignments are:

25%  First Examination
25%  Second Examination
25%  Project/Paper
25%  Problem Sets

Although the grade rests on individual effort, students are permitted to work together on problems sets. Students are encouraged to discuss and review among themselves. Exams are closed book, however, students will be provided with formula sheets. Students are warned that appropriation of materials without citation will be penalized and, depending on the seriousness of the appropriation, may result in the student failing the course.

The Meaning of Grades: Grades are assigned based on students display of knowledge of the materials covered in their text, lectures and assignments. The grades correspond to varying levels of mastery.

4.0 The student is facile with the concepts taught in the course and can apply them to unfamiliar problems.

3.5 The student has a firm understanding of the concepts taught in the course and can readily apply them to familiar problems.

3.0 The student understands basic concepts but is not fully comfortable in applying the concepts to problems similar to those covered in the course.

2.5 The student does not have sufficient understanding of basic concepts or their application.

As these standards indicate, a 3.0 reflects mastery of a substantial body of knowledge and is not a default grade for the course.

Required Materials:

(1) E.R. Tufte: Visual and Statistical Thinking
(2) Golnick and Smith: Cartoon Guide to Statistics
Optional text:

Students wishing to review basic statistics should refer to their undergraduate text (if they have kept it) or to


Lab and Review Sessions: Ryan Petty will run a discussion session each week for LIR 832. He will review assignments and provide solutions, review course material, teach students to use class software and work with students on computer assignments. The sessions will be held twice a week (the sessions are the same, the times of the sessions will be determined from the schedules which you have submitted on the first day of class). The lab sessions are a useful element of mastering the materials in this class and students should make every effort to attend each week.

Policies:

1. **All Assignments Are Due on the Assigned Dates.** Students may arrange in advance to turn assignments in late if there is an appropriate reason. Assignments which are turned in late and for which there has been no pre-arrangement will not be accepted absent a medical excuse.

2. **Academic honesty:** Academic dishonesty will not be tolerated. If you have any questions about academic dishonesty, please consult *Spartan Life: Student Handbook and Resource Guide* (http://www.vps.msu.edu/SpLife/index.htm) and/or the MSU Web site: http://www.msu.edu/unit/ombud/RegsOrdsPolicies.html.

3. **Accommodations for persons with disabilities:** Students with disabilities should contact an Instructor (contact information above), as well as the Resource Center for Persons with Disabilities to establish reasonable accommodations. For an appointment with a counselor, call 353-9642 (voice) or 355-1293 (TTY).

4. **Class Climate and Behavior:** We intend to create a positive learning environment for all of our students. This means that we expect you to treat not only ourselves, but your colleagues as well, with dignity and respect. Learning requires critical thinking and asking for clarification; you should feel free to do so in class and in office hours. Please come to class ready to attend to and clarify the information that is being presented. If you have any questions about disruptive behavior, please consult: Article 2.3.5 of the *Academic Freedom Report* (AFR) (http://www.vps.msu.edu/SpLife/actfree.htm).

5. **Breaks During Class:** We will have a couple of breaks per class, usually about 10 minutes long.

6. **Software:** You will be required to know how to perform basic functions in at least 1 statistical software package to complete homework assignments. The instructors at various times during Syllabus, LIR 832, Fall, 2008, page 3
the semester will be demonstrating how to perform basic functions in Minitab—both of which are available in the LIR computer lab. Students can choose to use either software program to complete any homework assignment, based on personal preference. Students who are not familiar with a statistical software package should feel free to contact the instructors during office hours for help in navigating the software and/or make an effort to do so on their own.

Please bring a calculator to class with you. A simple model which takes square roots will suffice although more expensive calculators with more advanced statistical functions can be useful.

About the Instructor

Teaching Philosophy: My job – and goal – is to help each of you learn and be successful in this class. It is my experience that you will do well if you put in the effort the course requires from you, the outcome should be commensurate with that effort. I look forward to discussing course-related topics during office hours or at a mutually agreeable time. If you are having any difficulty with the course, please contact Ryan or myself.
Course Schedule

Week of August 25th:
Course overview
Some Fundamental Issues
Statistics in Labor Relations and Human Resources

Basic Statistical Concepts: As you have passed the qualifying exam, you have a fundamental understanding of statistical concepts. We will spend two weeks reviewing and, more important expanding and applying some of these concepts to HR/LR issues.

Important Statistical Concepts

- Populations, Samples and Sampling
- Probability Distributions & the Normal
- Central Limit Theorem and Distributions of Sample Means

Troy: Weeks of September 1st & 8th:
EL: Weeks of September 8th & 15th:

Univariate Hypothesis Testing with Human Resource Applications

Troy: Week of September 15th & 22nd:
EL: Week of September 22nd & 29th:

Multi-Variate Statistics and Regression: Although univariate statistics are useful, we are typically more interested in the relationship between variables. For example, we would like to know how a training program affects employee productivity. This requires understanding covariance, the foundation of multi-variate statistics. We will spend considerable time learning about and using regression analysis, a technique that will allow us to measure and do hypothesis tests on causal relations. For example, we can measure the relationship between a training program and the change in employee productivity using regression.

A First Pass at Multi-variate Statistics:
- Covariance and Correlation
- Introduction to Minitab

Troy: Week of September 29th:
EL: Week of October 6th:

Overview of Regression Analysis & OLS

Troy: Week of October 6th
EL: Week of October 13th
First Exam

**Troy:** Week of October 13th
**EL:** Week of October 20th

Regression Overview Continued

**Troy:** Week of October 20th
**EL:** Week of October 27th

Multi-variate Regression:
Week of October 27th:

The multi-variate regression topic will include hypothesis testing in regression models, choosing explanatory variables, choosing functional forms, and issues with multi-collinearity

**Troy:** Weeks of October 27th & November 10th
**EL:** Week of November 10th and November 17th:

Care and Cleaning of Data, Important Data Sources for HR/LR, essay/project assignment

Essay assignment

**Troy:** Week of October 17th
**EL:** Week of October 24th

**Visual Display of Quantitative Information:** The availability of powerful desktop computers and good software allow us to use graphics to display and analyze data. Well thought out graphics are a powerful tool of analysis, poorly thought out graphics do little to help us gain insights. We will spend the final weeks of the course learning how to compact and persuasive graphics for displaying data.

Week of December 1st:

Essay due/Project due

Second Examination:

East Lansing: Monday, December 8, 6:00 - 8:00pm
Troy: Thursday, December 11, 6:00 - 8:00pm