Course Description

Welcome to Intermediate Social Statistics (SOCI 4312/6312). This course will provide students with the tools to conduct multivariate statistical research. This course emphasizes how to use, apply, interpret and understand statistical methods for social scientific research. This course does not emphasize abstract mathematical concepts or complex formulas. Instead, I will stress the ability to apply and utilize advanced statistical techniques in actual research projects. To this end, we will take a systematic approach to the exposition of the general linear model primarily for continuous dependent variables, but also for regression with categorical and limited dependent variables. You will learn to use computerized statistical techniques using the software program SPSS (or SAS).

The course is divided into five sections. In the first section we will understand statistics as a component of the research process. Here we review the building blocks for regression analysis. This section will also help to refresh your memory from previous statistics courses and to provide a deeper, more formal presentation of familiar concepts. In the second section we focus on the assumptions and mechanics of the classical linear regression model, with an understanding of bivariate correlation and regression. From this part of the course you will have a good mechanical knowledge of regression analysis. The next section, part three of the course, extends your knowledge of regression from bivariate to multivariate techniques, e.g., multiple linear regression. This section will provide you with a deeper theoretical and applied understanding of the flexibility and limitations of the general linear regression model for social science data. In the fourth section we will examine common problems or regression diagnostics. In the final part of the course we will examine other, non-linear regression techniques.

You will need to spend time in the computer lab working on assignments and becoming familiar with statistical software and data analysis. This time is in addition to our regularly scheduled class time. For some class meetings, we will spend part of the normal class period in the lab (Clement Hall 219 or 217). At other times, however, you will need to find time to use the lab on your own.

Prerequisites for this course include: Social Statistics (SOCI 3311) and Methods of Social Research (SOCI 3322).

Evaluation will be based on 10 exercises over the course of the semester. Assessment is the same for undergraduate and graduate students. See below for details.
**Required Reading and Course Materials**

You will need two books and the CD-ROM listed below. Selected readings will be available as handouts and/or on the internet as web-linked documents [W].


Kristin Heck Sajadi. 2005. *Exploring with Statistics.* This CD contains a data manual and several data sets that we will use during the semester. [CD]

The computer lab is an essential component of the course, thus you must have an active UM email account (UUID & password) for this course. In the lab, you will have access to SPSS (or SAS) and MS Excel for statistical analyses. You are strongly encouraged to activate your UMDrive, http://umdrive.memphis.edu, for electronic storage of data sets and output.

**Course Guidelines**

1. Show up, and show up on time. Your regular and punctual attendance in class meetings for this course is required. I expect everyone to be here at the beginning of class and stay through until the end. There are very few legitimate excuses for missing a graduate-level course (even once), especially when we only meet once per week.

2. It is critical that you keep up with the assignments. More than in other social science courses, each lesson builds upon previous lessons. Moreover, the way to become proficient with statistical analysis is through practice. Late assignments will be penalized for each day that they are late. No assignment will be accepted after a week’s time (seven days) without an extenuating circumstance (e.g., thermonuclear war, planets collide, or similar catastrophe).

3. It’s often helpful to work in groups. I encourage students to work together, but to a point. You are encouraged to discuss assignments and data preparation with each other. The assignments you submit, however, must reflect your own work. For example, on computer assignments that require you to select variables for analysis, everyone is expected to choose their own variables and to interpret the results on their own. If a group selects the same variables, estimates the exact models and collaborates on interpreting their results, all students in the group will do the assignment over (with a penalty).

4. You will find that I am a reasonable person who designs straightforward assignments. I am not interested in tricking or confusing you, and I want you to do well in the course. Please see me if you have any questions or encounter any difficulties regarding the course.

5. Believe it or not, statistics can be fun. At least it doesn’t have to be so bad!
Assignments and Grading

You will complete ten (10) assignments, including the final assignment (#10), over the course of the semester. Assignments will be distributed in class most weeks and are normally due the following week in class.

In computing your final grade for the course, I will drop your lowest grade on any of assignments #1-9, so that each of these regular assignments is worth 10% of your final grade. The final assignment (#10) counts twice a regular assignment and is worth 20% of your final grade.

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Course Schedule

This outline provides a rough estimate of the time we will spend on each topic. The actual schedule is subject to change as necessary during the semester.

**Week #1:** January 24, 2005  
**Topic:** Course Introduction & Statistical Review  
**Read:**  
*AF* Ch. 1-3 (& Ch. 4-6 skim/review); *CD* (Introduction & Getting Started)

**Week #2:** January 31, 2005  
**Topic:** Ordinary Least Squares (OLS) Regression: Assumptions, concepts & mechanics in the bivariate context  
**Read:**  
*AF* Ch. 9; *CD* (Using SPSS)

**Week #3:** February 7, 2005  
**Topic:** OLS Regression: Estimation & hypothesis testing in the bivariate context  
**Read:**  
*Allison* Ch. 5

**Week #4:** February 14, 2005  
**Topic:** The logic of multivariate analysis  
**Read:**  
*AF* Ch. 10; *Allison* Ch. 1

**Week #5:** February 21, 2005  
**Topic:** Multiple Regression: An introduction & its functional form  
**Read:**  
*AF* Ch 11; *Allison* Ch. 2 & 6
Week #6: February 28, 2005
Topic: Multiple Regression: Estimation & hypothesis testing
Read: AF Ch 12; Allison Ch. 4

Spring Break March 7, 2005 Spring Break

Week #7: March 14, 2005
Topic: Multiple Regression: Group differences, dummy variables & interaction terms
Read: AF Ch. 7 (skim/review) & 13

Week #8: March 21, 2005
Topic: Regression Diagnostics: Omitted variables, measurement error & multicollinearity
Read: Allison Ch. 3 & 7

Week #9: March 28, 2005
Topic: Regression Diagnostics: Nonlinearity, heteroskedasticity & variable transformation
Read: AF Ch. 14; Allison Ch. 8

Week #10: April 4, 2005
Topic: Logistic Regression: binomial, multinomial & ordered
Read: AF Ch. 8 (skim/review) & 15; Allison pp. 183-5

Week #11: April 11, 2005
Topic: Advanced Topics: Event history & path analysis
Read: AF Ch. 16; Allison pp. 177-183, 185-6

Week #12: April 18, 2005
Topic: Applications: Assessing current research
Read: TBA: Research articles

Week #13: April 25, 2005
Topic: Applications & Wrap up
Read: TBA: Research articles

FINAL ASSIGNMENTS DUE BY 4:00 P.M. ON MONDAY, MAY 2nd, 2005