

## **Intermediate Quantitative Methods: E10.2003**

**Fall, 2008**

### **Instructors:**

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**Office Hours:** Wednesdays, 10 am to noon and by appointment (The week of Sept 8th, I will hold office hours on Sept 9th from 1-3pm. The week of Sept. 15th, I will hold office hours on Sept 17th from 12-1pm. Other weeks are as noted.)

**Class Meeting Time/Room:** Tuesdays, 3:30 to 6:10 pm in Room 408 Silver Center.

**Lab Section Meeting Times:** Attendance at the lab section is highly recommended and encouraged. Lab meets on Thursdays from 4:00 to 5:30pm at 194 Mercer, Room 304. The lab provides SPSS demonstrations of what is discussed in class, and hands-on guidance for homework assignments.

**Course Goals:** This course extends the material covered in E10.2001-2 by examining more deeply multiple regression/correlation as a general and flexible system for analyzing data in the behavioral, social, and health sciences. In addition to covering more advanced topics related to traditional multiple regression/correlation, the course examines ANOVA, ANCOVA, and Path Analysis as special cases of this general linear model. The software package, SPSS version 15, is used to give students hands-on experience with topics covered. In so doing, the course provides skills and knowledge critical to those graduate students whose research relies on the analysis of quantitative data.

**Course Orientation:** This course provides a conceptually oriented, nonmathematical approach to learning applied statistics. It is not appropriate for students seeking to learn the mathematical theory underlying the general linear model.

**Prerequisites:** E10.2001-2002 or at least one semester of another introductory statistics course.

**Website:** The course uses Blackboard for posting lecture notes, handouts, readings, homework assignments, project assignments, and general information.

**Text:** The course lecture notes serve as the primary text for the course, however, you are encouraged to purchase as a reference and guide: *Using Multivariate Statistics (5<sup>th</sup> edition)* by Tabachnick & Fidell. This book is available in the NYU Book Store; and also: *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences* by Cohen, Cohen, West, & Aiken (2003), LEA.

### **Course Requirements & Grading:**

**Supplementary Readings:** As posted on the Blackboard website.

**Homework:** Practicing what has been covered in class is essential to learning statistics. Homework will be assigned, collected, and graded each week. All students are responsible for completing all homework assignments on time and raising related questions in class.

**Grading:**

10% Class attendance and participation  
 90% Weekly computer-based homework sets (10 in all)

**Syllabus:**

<i>E10.2003 Syllabus – Intermediate Quantitative Methods</i>		
<i>Month</i>	<i>Day</i>	<i>Topic</i>
September	2	Statistical Procedures: A Conceptual Map; Univariate & Bivariate Statistics: A Review
	9	Statistical Control: The two-predictor case
	16	The $k$ Predictor Case: General Analytic Strategies – simultaneous, hierarchical, and stepwise approaches
	23	Statistical Inference in Multiple Regression
	30	No Class – Rosh Hashanah
October	7	Nonlinear Transformations and Regression Diagnostics: Checking and Addressing Underlying Assumptions
	14	No Class – Fall Break
	21	Suppression, Mediation (Using INDIRECT), Cross-Validation and Shrinkage, Collinearity; Critiquing a Journal Article
	28	Interactions – the case of a dichotomous and quantitative variable; and the case of two quantitative variables
November	4	<i>Post Hoc</i> Probing of Interactions – Using MODPROBE; Critiquing a Journal Article
	11	From single predictors to sets of multiple predictors: qualitative scales using dummy coding, quantitative scales, analytic strategies, proportion of VAF, tests of inference
	18	Model Building Strategies -- Tying it All Together; Critiquing a Journal Article; Power Analysis – Using GPOWER
	25	ANOVA and ANCOVA as Special Cases of GLM; Lord's Paradox
December	2	Path Analysis as a Special Case of GLM; Moderated Mediation – Using MODMED
	9	Characterizing differences among GLM methods; Wrapping Up.